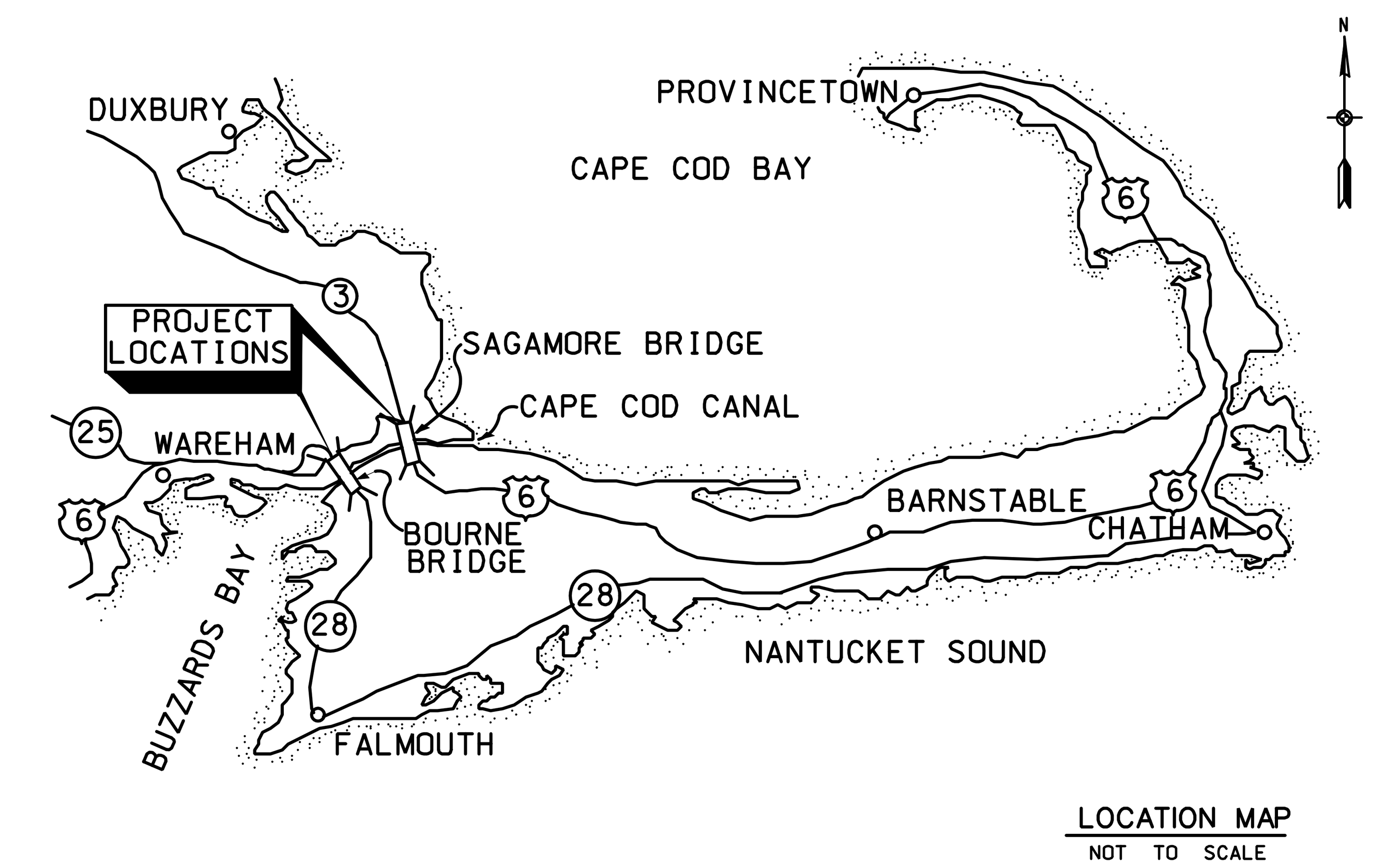
US Army Corps
of Engineers
New England District



DECK REPAIRS AND PAVING SAGAMORE AND BOURNE BRIDGES

BOURNE, MASSACHUSETTS

APPROVED FUNCTIONAL ADEQUACY /s/Joseph A. Colucci, P.E. TECHNICAL LEAD ENGINEER	2/15/05 DATE:
REVIEWED BY: /s/David R. Descoteaux, P.E. CHIEF, DESIGN BRANCH	2/05 DATE:
REVIEWED BY: /s/Raimo Liias, P.G. CH, HTRW/GEOTECH ENGRG BR	2/15/05 DATE:
RECOMMENDED BY: /s/Anthony T. Mackos, P.E. DEPUTY CHIEF, E/P DIV	2/15/05 DATE:
APPROVED BY: /s/David L. Dulong, P.E. CHIEF, ENGRG/PLANNING DIV	2/15/05 DATE:

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

THIS PROJECT WAS DESIGNED BY THE NEW ENGLAND DISTRICT OF THE U.S. ARMY CORPS OF ENGINEERS. THE INITIALS OR SIGNATURES AND REGISTRATION DESIGNATIONS OF INDIVIDUALS APPEAR ON THESE PROJECT DOCUMENTS, WITHIN THE SCOPE OF THEIR EMPLOYMENT AS REQUIRED BY ER 1110-1-8152.

CAPE COD CANAL
DECK REPAIRS AND PAVING
SAGAMORE AND BOURNE BRIDGES
BOURNE, MASSACHUSETTS

COVER SHEET

VALUE ENGINEERING PAYS DIVIDENDS

SAFETY PAYS

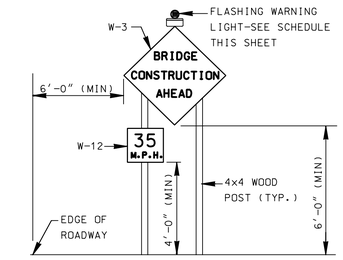
SOLICITATION # W912WJ-05-R-0004

Reference number:
G-1

Sheet 1 of 11

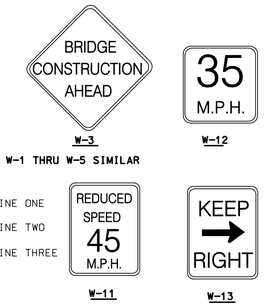
TRAFFIC SIGN SCHEDULE – SAGAMORE BRIDGE WORK

IDENT. NUMBER	NUMBER REQ'D.	BOARD SIZE	DESCRIPTION	NUMBER OF LINES	FLASHING WARNING LIGHT	REMARKS
W-1	2	48"x48"	BRIDGE CONSTRUCTION – 1 MILE	3	●	1. SEE "SIGN TYPES" AND "SIGN ELEVATION"
W-2	2	48"x48"	BRIDGE CONSTRUCTION – 2 MILES	3		2. SEE SHEET C-2 FOR LOCATIONS OF SIGNS.
W-3	7	48"x48"	BRIDGE CONSTRUCTION AHEAD	3		3. SIGN TYPES W-10 THROUGH W-12 TO BE MOUNTED ON POSTS WITH WARNING SIGNS.
W-4	2	48"x48"	ONE LANE TRAFFIC – AHEAD	3		4. SIGN TYPE W-13 TO BE MOUNTED ON TRAFFIC DRUM OR JERSEY BARRIER.
W-5	4	48"x48"	NO WIDE LOADS	3	●	
W-10	3	24"x30"	REDUCED SPEED AHEAD	3		
W-11	2	24"x30"	REDUCED SPEED 45 M.P.H.	4	●	
W-12	3	24"x24"	35 M.P.H.	2		
W-13	4	24"x30"	KEEP RIGHT	3		
AB-L	–	N/A	ARROW BOARD – POINTING LEFT	N/A	SEE THIS SHEET FOR LOCATIONS	
AB-R	1	N/A	ARROW BOARD – POINTING RIGHT	N/A	SEE THIS SHEET FOR LOCATIONS	
MB	2	N/A	MESSAGES TO BE DETERMINED	3	SEE THIS SHEET FOR LOCATIONS	



SIGN ELEVATION (TYPICAL W1–W12)

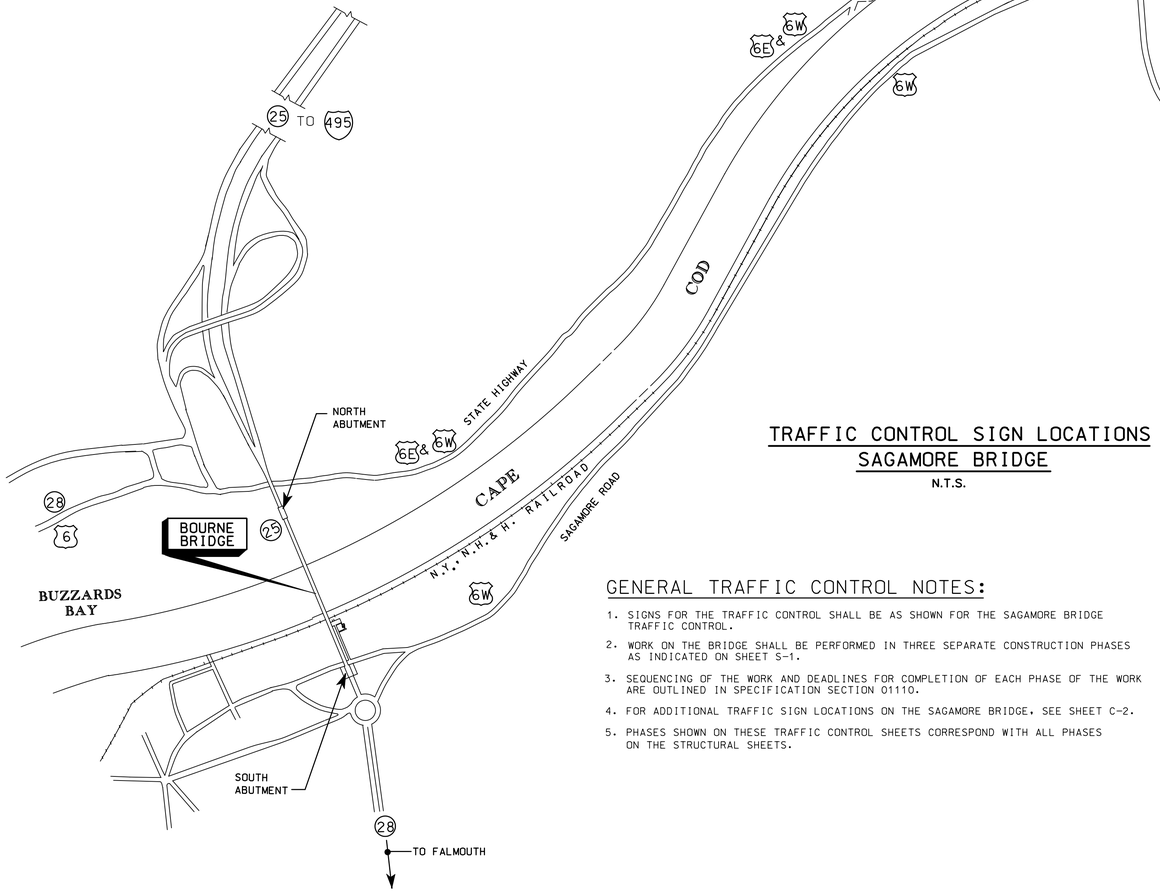
N.T.S.



NOTE: FOR SIGN DESIGNATIONS, SEE TRAFFIC SIGN SCHEDULE.

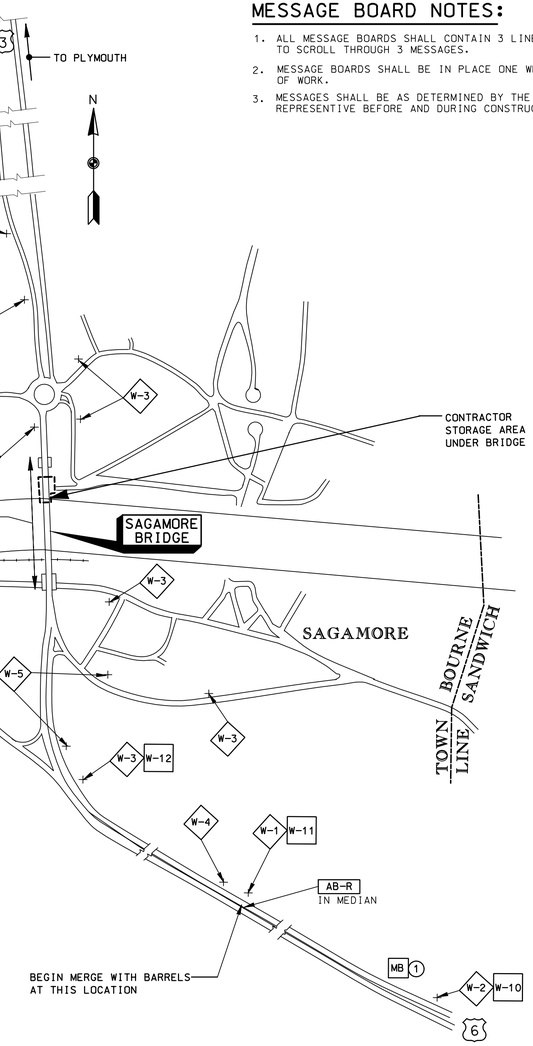
SIGN TYPES

N.T.S.



TRAFFIC CONTROL SIGN LOCATIONS
SAGAMORE BRIDGE

N.T.S.



MESSAGE BOARD NOTES:

1. ALL MESSAGE BOARDS SHALL CONTAIN 3 LINES AND SHALL BE ABLE TO SCROLL THROUGH 3 MESSAGES.
2. MESSAGE BOARDS SHALL BE IN PLACE ONE WEEK PRIOR TO THE START OF WORK.
3. MESSAGES SHALL BE AS DETERMINED BY THE CONTRACTING OFFICER'S REPRESENTIVE BEFORE AND DURING CONSTRUCTION.

GENERAL TRAFFIC CONTROL NOTES:

1. SIGNS FOR THE TRAFFIC CONTROL SHALL BE AS SHOWN FOR THE SAGAMORE BRIDGE TRAFFIC CONTROL.
2. WORK ON THE BRIDGE SHALL BE PERFORMED IN THREE SEPARATE CONSTRUCTION PHASES AS INDICATED ON SHEET S-1.
3. SEQUENCING OF THE WORK AND DEADLINES FOR COMPLETION OF EACH PHASE OF THE WORK ARE OUTLINED IN SPECIFICATION SECTION 01110.
4. FOR ADDITIONAL TRAFFIC SIGN LOCATIONS ON THE SAGAMORE BRIDGE, SEE SHEET C-2.
5. PHASES SHOWN ON THESE TRAFFIC CONTROL SHEETS CORRESPOND WITH ALL PHASES ON THE STRUCTURAL SHEETS.

INDEX TO DRAWINGS

US Army Corps of Engineers
New England District

Symbol	Description	Date	Appr.	Symbol	Description	Date	Appr.

Date: February 2005
Rev:
Solicitation no.: W912WJ-05-R-0004
Drawing code: CAP-105
File name: SBRC101.S02
Plot date: February 2005
Plot scale:

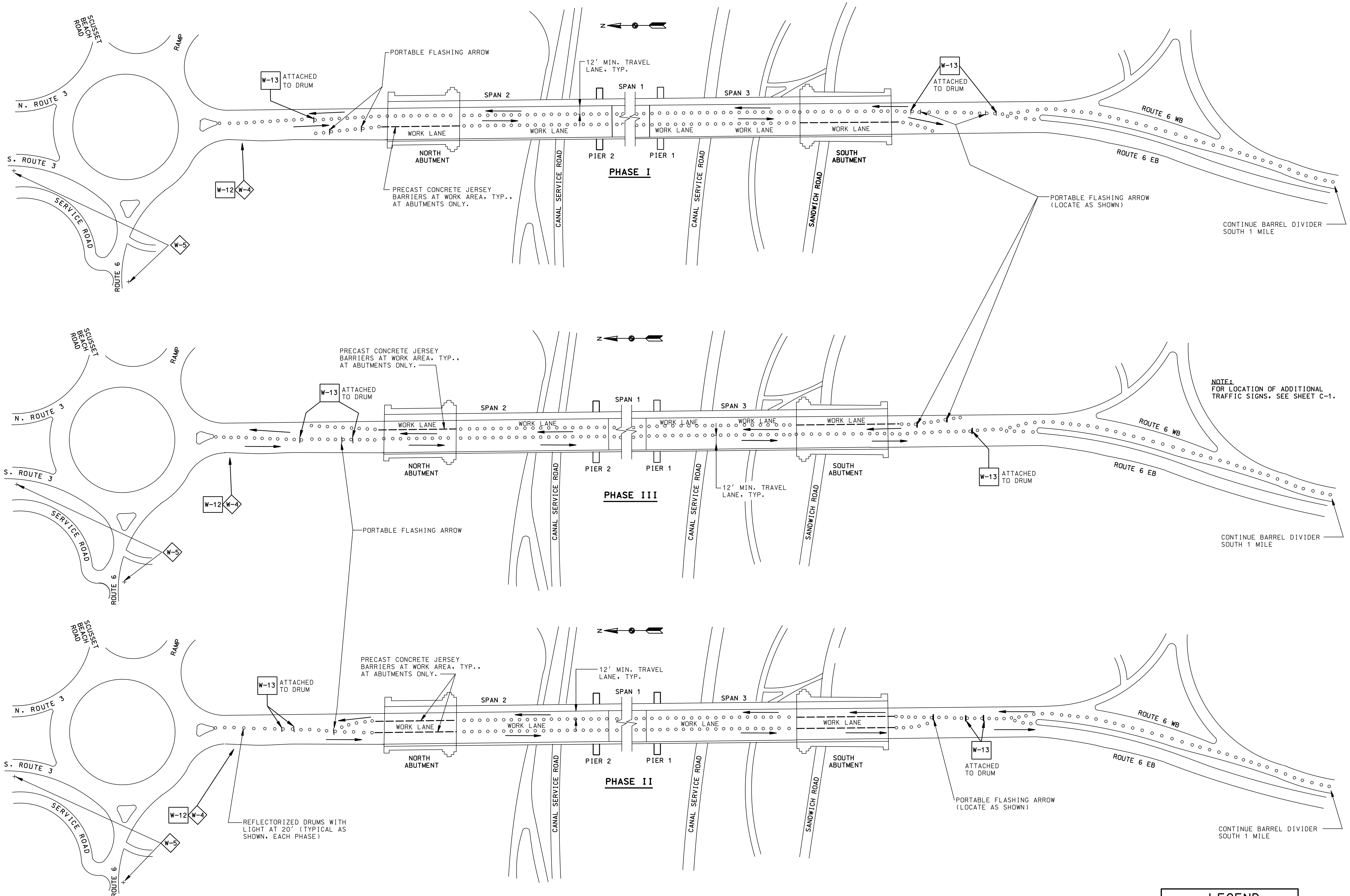
Designed by: Joseph A. Colucci
Drawn by: Lisa Greene
Reviewed by: Kenneth B. Flanagan
Submitted by: /s/ Joseph A. Colucci
Team Leader, Technical Lead Unit

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

CAPE COD CANAL
DECK REPAIRS AND PAVING
SAGAMORE AND BOURNE BRIDGES
BOURNE, MASSACHUSETTS

SAGAMORE BRIDGE
TRAFFIC CONTROL SIGN LOCATIONS AND INDEX TO DRAWINGS

Reference number:
C-1
Sheet 2 of 11



TRAFFIC CONTROL PLANS – SAGAMORE BRIDGE

N.T.S.

LEGEND

o	REFLECTORIZED DRUMS W/LIGHTS @ 20' SPACING
– –	PRECAST CONCRETE "JERSEY" BARRIER

US Army Corps of Engineers
New England District

Symbol	Description	Date	Appr.

Symbol	Description	Date	Appr.

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

Designed by: Joseph A. Colucci
Drawn by: Edward Mills
Reviewed by: /s/ Jennifer Flanagan
Submitted by: /s/ Joseph A. Colucci
Team Leader, Technical Lead Unit

Date: February 2005
Rev.
Solicitation no. W912WJ-05-R-0004
Drawing code: CAP-105
File name: SBRc102.s03
Plot date: February 2005
Plot scale:

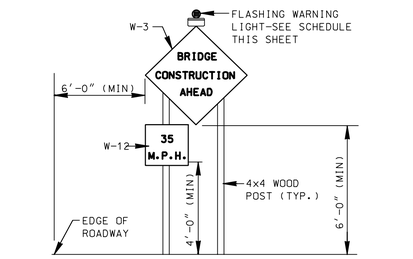
CAPE COD CANAL
DECK REPAIRS AND PAVING
SAGAMORE AND BOURNE BRIDGES
BOURNE, MASSACHUSETTS

SAGAMORE BRIDGE
TRAFFIC CONTROL PLANS

Reference number:
C-2

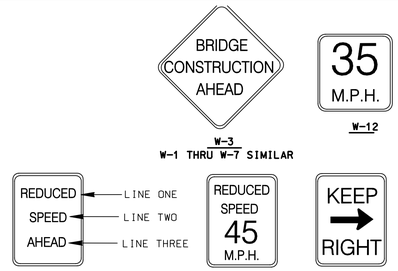
TRAFFIC SIGN SCHEDULE – BOURNE BRIDGE WORK

IDENT. NUMBER	NUMBER REQ'D.	BOARD SIZE	DESCRIPTION	NUMBER OF LINES	FLASHING WARNING LIGHT	REMARKS
W-1	2	48"x48"	BRIDGE CONSTRUCTION – 1 MILE	3	●	1. SEE "SIGN TYPES" AND "SIGN ELEVATION"
W-2	2	48"x48"	BRIDGE CONSTRUCTION – 2 MILES	3		
W-3	4	48"x48"	BRIDGE CONSTRUCTION AHEAD	3		2. SIGN TYPES W-10 THROUGH W-12 TO BE MOUNTED ON POSTS WITH WARNING SIGNS.
W-4	3	48"x48"	ONE LANE TRAFFIC – AHEAD	3		
W-5	3	48"x48"	NO WIDE LOADS	3	●	3. SIGN TYPE W-13 TO BE MOUNTED ON TRAFFIC DRUM OR JERSEY BARRIER.
W-6	1	48"x48"	BOURNE BRIDE TRAFFIC – RIGHT LANE	3	●	
W-7	1	48"x48"	RT. 25 & LOCAL TRAFFIC – LEFT LANE	3	●	
W-10	5	24"x30"	REDUCED SPEED AHEAD	3		
W-11	1	24"x30"	REDUCED SPEED 45 M.P.H.	4	●	
W-12	2	24"x24"	35 M.P.H.	2		
W-13	2	24"x30"	KEEP RIGHT	3		
AB-L	–	N/A	ARROW BOARD – POINTING LEFT	N/A		SEE THIS SHEET FOR LOCATIONS
AB-R	1	N/A	ARROW BOARD – POINTING RIGHT	N/A		SEE THIS SHEET FOR LOCATIONS
MB	2	N/A	MESSAGES TO BE DETERMINED	3		SEE THIS SHEET FOR LOCATIONS



SIGN ELEVATION (TYPICAL W1–W12)

N.T.S.



NOTE: FOR SIGN DESIGNATIONS, SEE TRAFFIC SIGN SCHEDULE.

SIGN TYPES

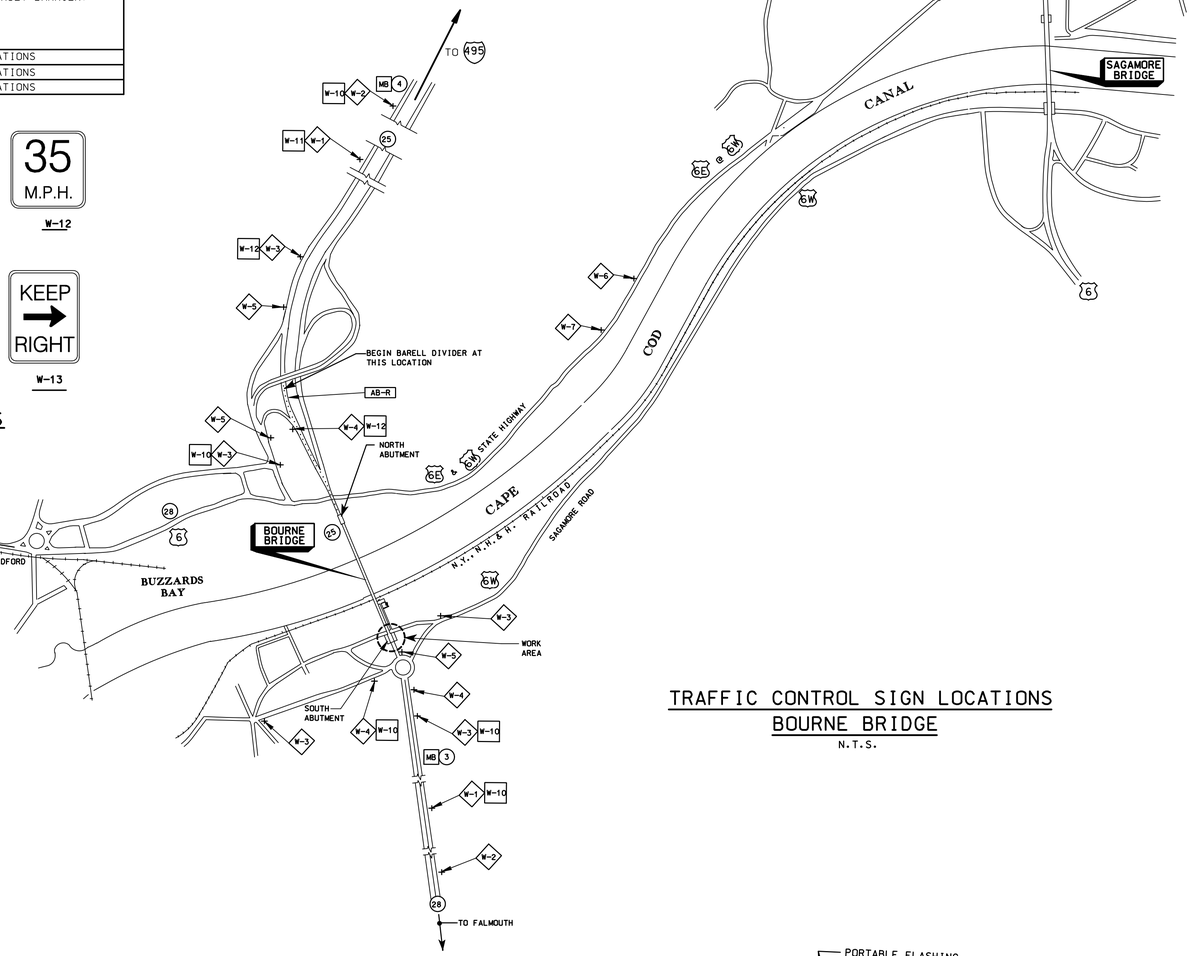
N.T.S.

GENERAL TRAFFIC CONTROL NOTES:

1. WORK SHALL BEGIN ON THE BOURNE BRIDGE AFTER ALL WORK ON THE SAGAMORE BRIDGE HAS BEEN COMPLETED.
2. WORK ON THE BOURNE BRIDGE SHALL BE PERFORMED IN ONE CONSTRUCTION PHASE AS INDICATED ON SHEET S-2.
3. SEQUENCING OF THE WORK AND DEADLINE FOR COMPLETION OF THE WORK ARE OUTLINED IN SPECIFICATION SECTION 01110.
4. SEE SHEETS C-1 & C-2 FOR SAGAMORE BRIDGE TRAFFIC CONTROL PLANS.

MESSAGE BOARD NOTES:

1. MESSAGE BOARDS SHALL CONTAIN 3 LINES AND SHALL BE ABLE TO SCROLL THROUGH 3 MESSAGES.
2. MESSAGE BOARDS SHALL BE IN PLACE 1 WEEK PRIOR TO THE START OF WORK.
3. MESSAGES TO BE DETERMINED BY THE CONTRACTING OFFICER'S REPRESENTATIVE BEFORE AND DURING CONSTRUCTION.

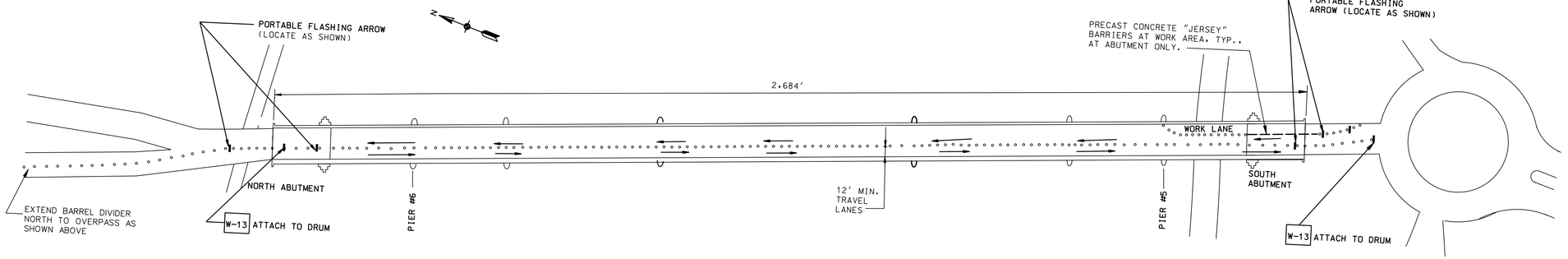


TRAFFIC CONTROL SIGN LOCATIONS
BOURNE BRIDGE

N.T.S.

LEGEND

○	REFLECTORIZED DRUMS W/LIGHTS @ 20' SPACING
– – –	PRECAST CONCRETE "JERSEY" BARRIER



TRAFFIC CONTROL PLAN – BOURNE BRIDGE

N.T.S.

US Army Corps of Engineers
New England District

Symbol	Description	Date	Appr.	Symbol	Description	Date	Appr.

Date: February 2005
Rev.:
Solicitation no.: W912WJ-05-R-0004
Drawing code: CAP-105
File name: SBR103.dgn
Plot date: 9 February 2005
Plot scale: 1" = 1'-0"

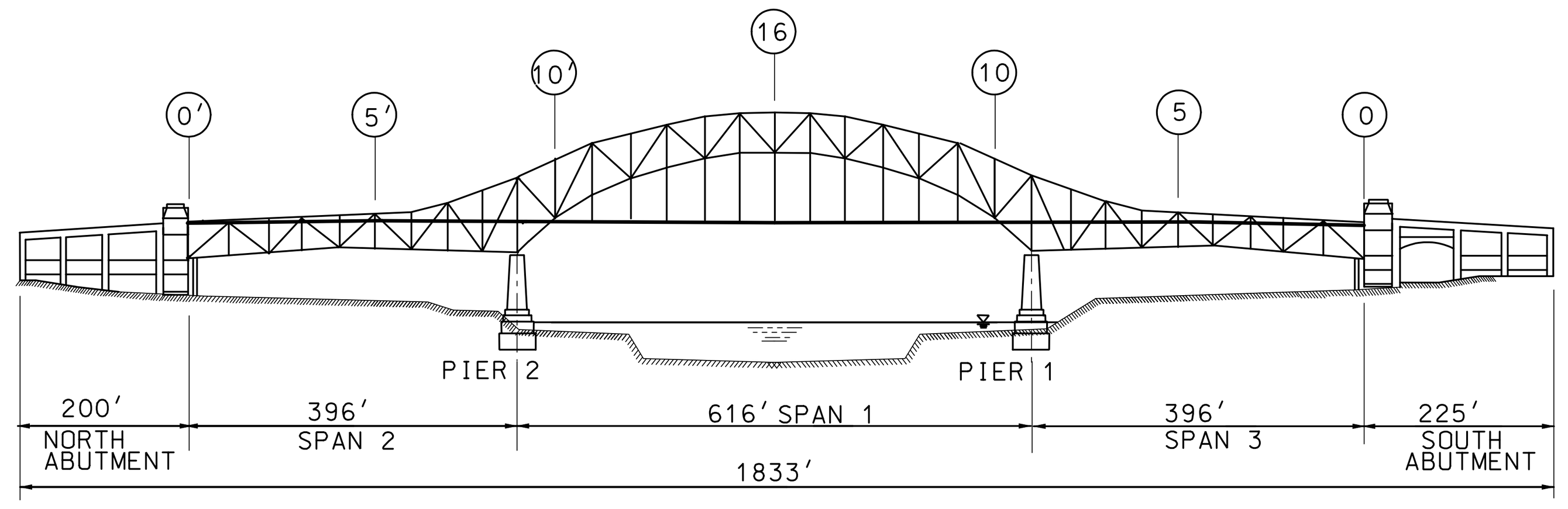
Designed by: Joseph A. Colucci
Drawn by: Jennifer Flanagan
Reviewed by: Jennifer Flanagan
Submitted by: /s/ Joseph A. Colucci
Team Leader, Technical Lead Unit

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

CAPE COD CANAL
DECK REPAIRS AND PAVING
SAGAMORE AND BOURNE BRIDGES
BOURNE, MASSACHUSETTS

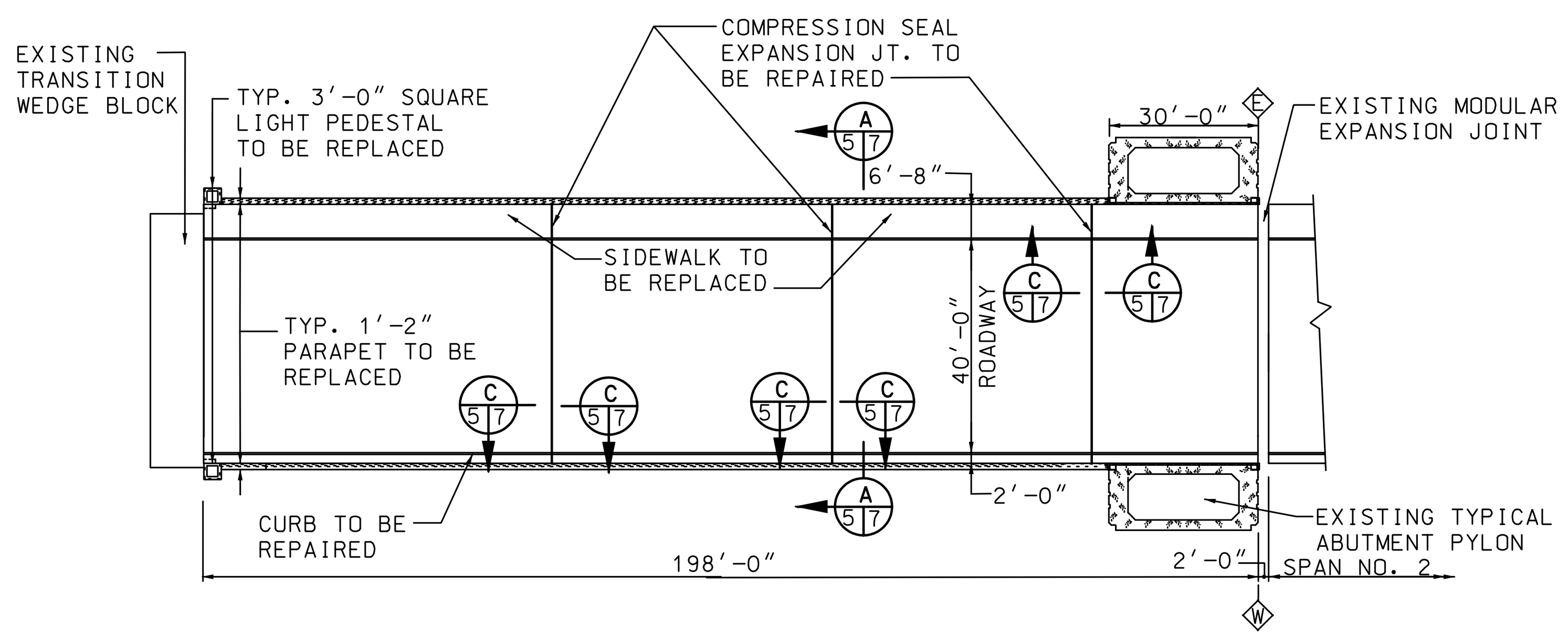
BOURNE BRIDGE TRAFFIC CONTROL SIGN LOCATIONS AND TRAFFIC CONTROL PLAN

Reference number:
C-3
Sheet 4 of 11



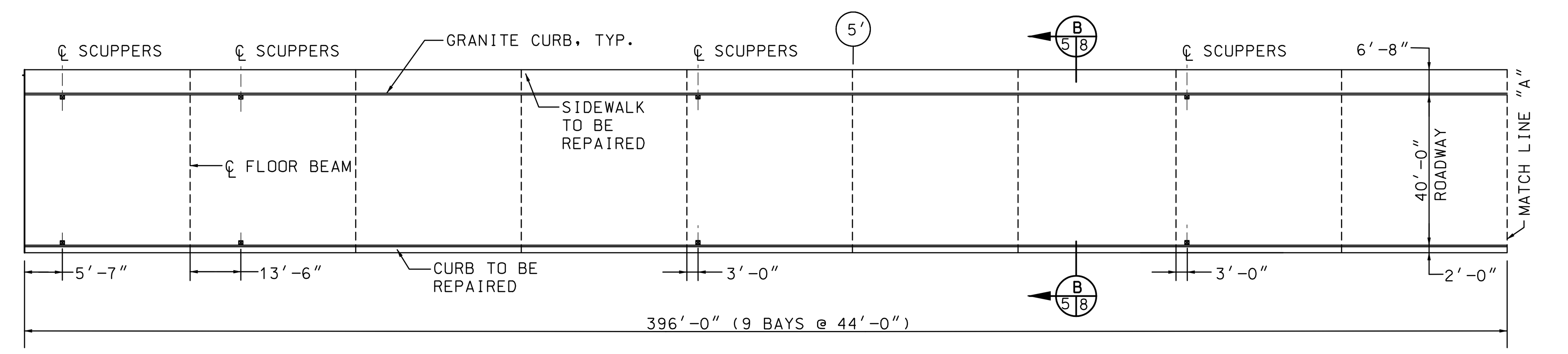
SAGAMORE BRIDGE – WEST ELEVATION

N.T.S.



SAGAMORE NORTH ABUTMENT PLAN

SCALE: 1" = 30'



SPAN NO. 2

SCALE: 1" = 30'

SEQUENCE OF WORK:

1. WORK ON THE SAGAMORE BRIDGE SHALL BE CONDUCTED IN 3 PHASES AS INDICATED.
2. SEE SPECIFICATION SECTION 01110 FOR FURTHER INFORMATION REGARDING THE SEQUENCING OF CONSTRUCTION AND THE REQUIRED COMPLETION DATES FOR EACH PHASE OF CONSTRUCTION.

PHASING OF WORK:

PHASE I:

THIS WORK WILL REQUIRE CLOSURE OF THE CURB SIDE TRAFFIC LANE:

a. REPAIR THE CONCRETE ON THE TOP OF THE CURB OF THE ABUTMENTS.
b. REMOVE AND REPLACE THE ABUTMENT PARAPETS. RE-USE THE GRANITE CAP STONES.
c. REPAIR THE CONCRETE ON THE ROADWAY SIDE OF THE ABUTMENT PYLONS (CURB SIDE) AND REPLACE THE LIGHT PEDESTALS AT THE ENDS OF THE ABUTMENTS.
d. REPAIR THE ABUTMENT COMPRESSION SEAL TYPE EXPANSION JOINT STEEL ON THE CURB.
e. REPAIR CONCRETE ON TOP OF THE CURB FOR THE ENTIRE LENGTH OF THE BRIDGE.
f. REPOINT ALL DETERIORATED GRANITE CURBING JOINTS ALONG THE ENTIRE LENGTH OF THE BRIDGE AND ABUTMENTS. REMOVE AND RESET ANY LOOSE GRANITE CURBING AS NECESSARY.
g. REPAIR THE EXPANSION JOINTS AT PANEL POINTS 10 AND 10'.
h. REPLACE ALL CURB SIDE ELECTRIC HAND-HOLES ALONG THE ENTIRE LENGTH OF THE BRIDGE, INCLUDING THE ABUTMENTS.
i. REPLACE ALL ELECTRIC WIRING FOR THE STREET LIGHTING, NAVIGATION LIGHTS, AND OBSTRUCTION LIGHTS.
j. APPLY THE SPECIFIED COATING ON THE SURFACE OF THE CURB FOR THE ENTIRE LENGTH OF THE BRIDGE AND ABUTMENTS, AND SEAL THE ABUTMENT PYLONS, NEW PARAPETS AND LIGHT PEDESTALS AS SPECIFIED.
k. REMOVE THE 2" OF EXISTING PAVEMENT AND EXISTING MEMBRANE FROM THE DECK (ROADWAY) FOR THE ENTIRE LENGTH OF THE BRIDGE. AT SAGAMORE ABUTMENTS, REMOVE 2" OF EXISTING 5,000 PSI MICRO-SILICA CONCRETE.
l. REMOVE AND REPLACE GROUT UNDER CURB SIDE GRANITE CURBING TO PROVIDE ADEQUATE BEARING.
m. REPAIR ALL UNSOUND OR DELAMINATED CONCRETE ON THE DECK FOR THE ENTIRE LENGTH OF THE BRIDGE, INCLUDING THE ABUTMENTS.
n. PROVIDE 2" OF ROSPHALT PAVEMENT ON THE DECK AND ABUTMENT ROADWAY.
o. PROVIDE PAVEMENT MARKINGS (REFLECTORIZED PAINT) AS SPECIFIED.

PHASE II:

THIS WORK WILL REQUIRE CLOSURE OF THE MIDDLE TRAFFIC LANE:

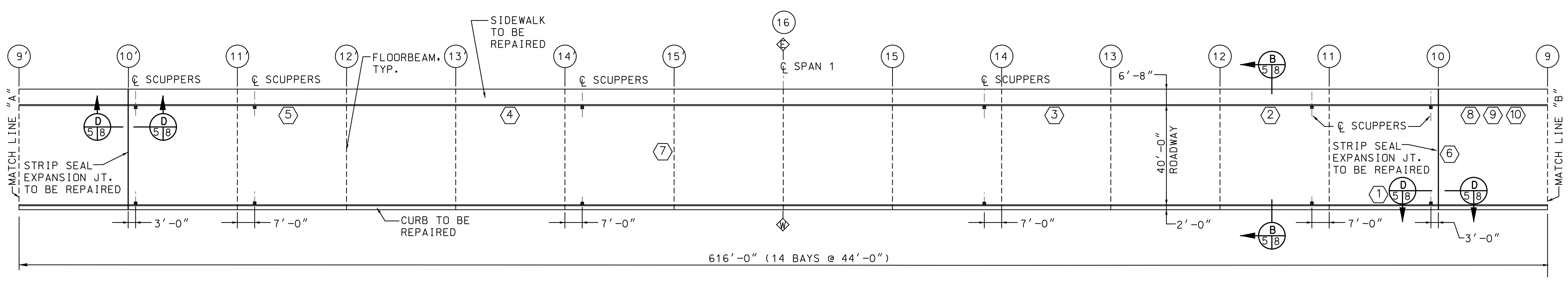
a. REMOVE THE 2" OF EXISTING PAVEMENT AND EXISTING MEMBRANE FROM THE DECK (ROADWAY) FOR THE ENTIRE LENGTH OF THE BRIDGE. AT SAGAMORE ABUTMENTS, REMOVE 2" OF EXISTING 5,000 PSI MICRO-SILICA CONCRETE.
b. REPAIR ALL UNSOUND OR DELAMINATED CONCRETE ON THE DECK FOR THE ENTIRE LENGTH OF THE BRIDGE, INCLUDING THE ABUTMENTS.
c. REPAIR THE EXPANSION JOINTS AT PANEL POINTS 10 AND 10'.
d. PROVIDE 2" OF ROSPHALT PAVEMENT ON THE DECK AND ABUTMENT ROADWAY.
e. PROVIDE PAVEMENT MARKINGS (REFLECTORIZED PAINT) AS SPECIFIED.

PHASE III:

THIS WORK WILL REQUIRE CLOSURE OF THE SIDEWALK SIDE TRAFFIC LANE:

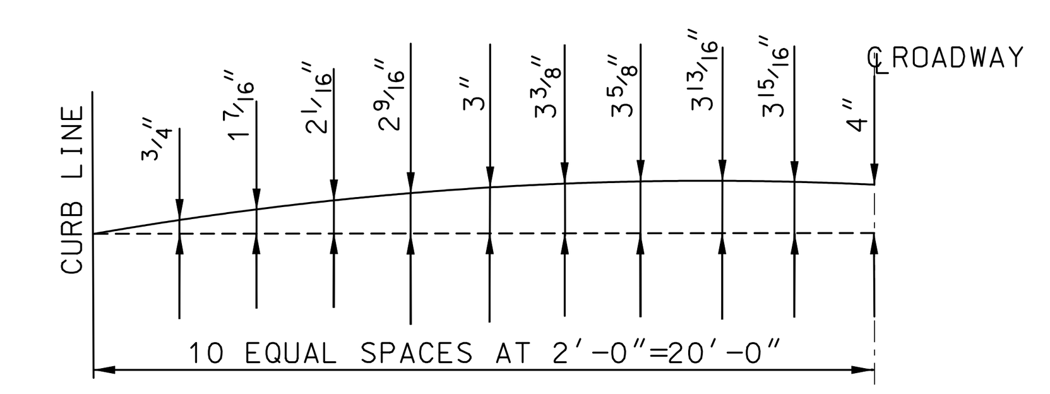
a. REMOVE AND REPLACE THE SIDEWALKS AND RESET THE GRANITE CURBING ON THE ABUTMENTS.
b. REMOVE AND REPLACE THE ABUTMENT PARAPETS. RE-USE THE GRANITE CAP STONES.
c. REPAIR THE CONCRETE ON THE ROADWAY SIDE OF THE ABUTMENT PYLONS (SIDEWALK SIDE) AND REPLACE THE LIGHT PEDESTALS AT THE ENDS OF THE ABUTMENTS.
d. REPAIR THE ABUTMENT COMPRESSION SEAL TYPE EXPANSION JOINT STEEL ON THE SIDEWALK.
e. REPAIR THE CONCRETE OF THE SIDEWALK (AS NECESSARY) FOR THE ENTIRE LENGTH OF THE BRIDGE.
f. REPOINT ALL GRANITE CURBING ALONG THE ENTIRE LENGTH OF THE BRIDGE. REMOVE AND RE-SET ANY LOOSE GRANITE CURBING AS NECESSARY.
g. REPAIR THE EXPANSION JOINTS AT PANEL POINTS 10 AND 10'.
h. REPLACE ALL SIDEWALK SIDE ELECTRIC HANDHOLES ALONG THE ENTIRE LENGTH OF THE BRIDGE AND THE ABUTMENTS.
i. REPLACE ALL ELECTRIC WIRING FOR THE STREET LIGHTING, NAVIGATION LIGHTS, AND OBSTRUCTION LIGHTS.
j. APPLY THE SPECIFIED COATING ON THE SURFACE OF THE SIDEWALK FOR THE ENTIRE LENGTH OF THE BRIDGE AND ABUTMENTS, AND SEAL THE ABUTMENT PYLONS, NEW PARAPETS AND LIGHT PEDESTALS AS SPECIFIED.
k. REMOVE THE 2" OF EXISTING PAVEMENT AND EXISTING MEMBRANE FROM THE DECK (ROADWAY) FOR THE ENTIRE LENGTH OF THE BRIDGE. AT SAGAMORE ABUTMENTS REMOVE 2" OF EXISTING 5,000 PSI MICRO-SILICA CONCRETE.
l. REMOVE AND REPLACE GROUT UNDER SIDEWALK SIDE GRANITE CURBING TO PROVIDE ADEQUATE BEARING FOR THE STONES.
m. REPAIR ALL UNSOUND OR DELAMINATED CONCRETE ON DECK FOR THE ENTIRE LENGTH OF THE BRIDGE, INCLUDING THE ABUTMENTS.
n. PROVIDE 2" OF ROSPHALT PAVEMENT ON THE DECK AND ABUTMENT ROADWAY.
o. PROVIDE PAVEMENT MARKINGS (REFLECTORIZED PAINT) AS SPECIFIED.

LEGEND	
⟨E⟩	EAST
⟨W⟩	WEST
(16)	PANEL POINT
⟨2⟩	STEEL REPAIR



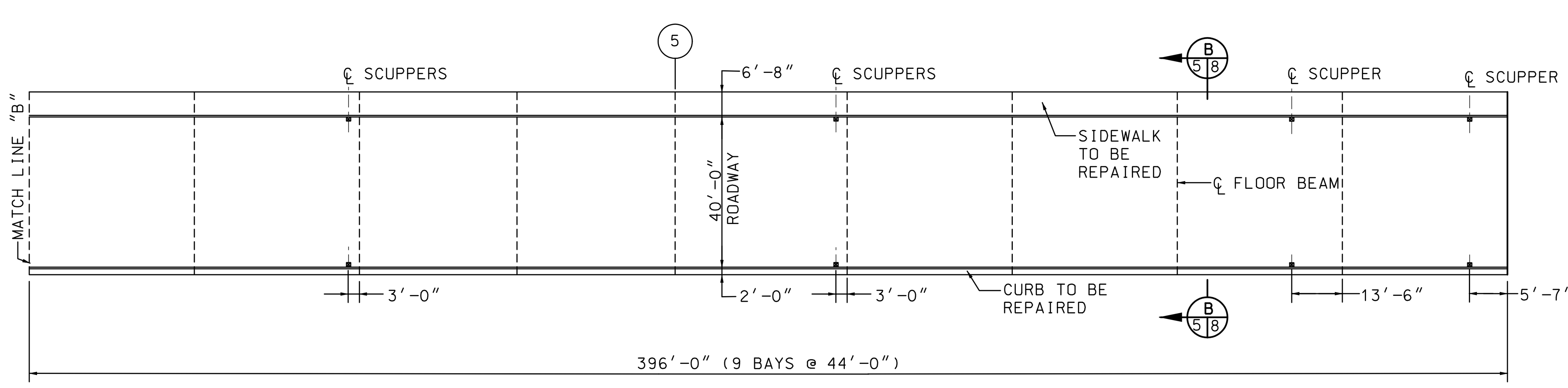
SPAN NO. 1

SCALE: 1" = 30'



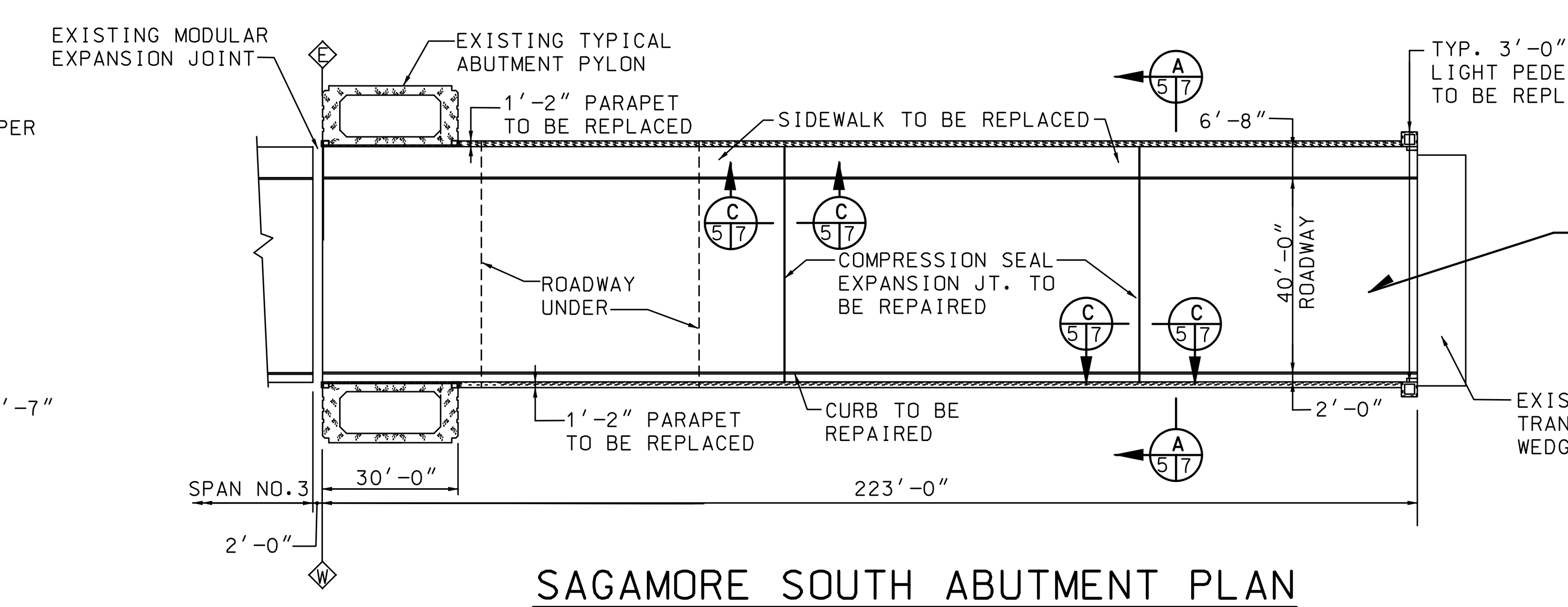
ROADWAY CAMBER DETAIL

NOT TO SCALE



SPAN NO. 3

SCALE: 1" = 30'



NOTE:

THE EXISTING WEARING SURFACE ON THE SAGAMORE BRIDGE ABUTMENTS CONSISTS OF 5,000 PSI MICRO-SILICA CONCRETE. THE CONTRACTOR SHALL SCARIFY THE CONCRETE DOWN A MINIMUM OF 2" TO ACCOMODATE THE NEW 2" ROSPHALT PAVEMENT WEARING SURFACE.

SAGAMORE SOUTH ABUTMENT PLAN

SCALE: 1" = 30'

30' 0 30' 60'
SCALE: 1"= 30'

US Army Corps of Engineers
New England District

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

Designed by: Joseph A. Colucci
Drawn by: Edward Mills
Reviewed by: /s/ Jennifer Flanagan
Submitted by: /s/ Joseph A. Colucci
Team Leader, Technical Lead Unit

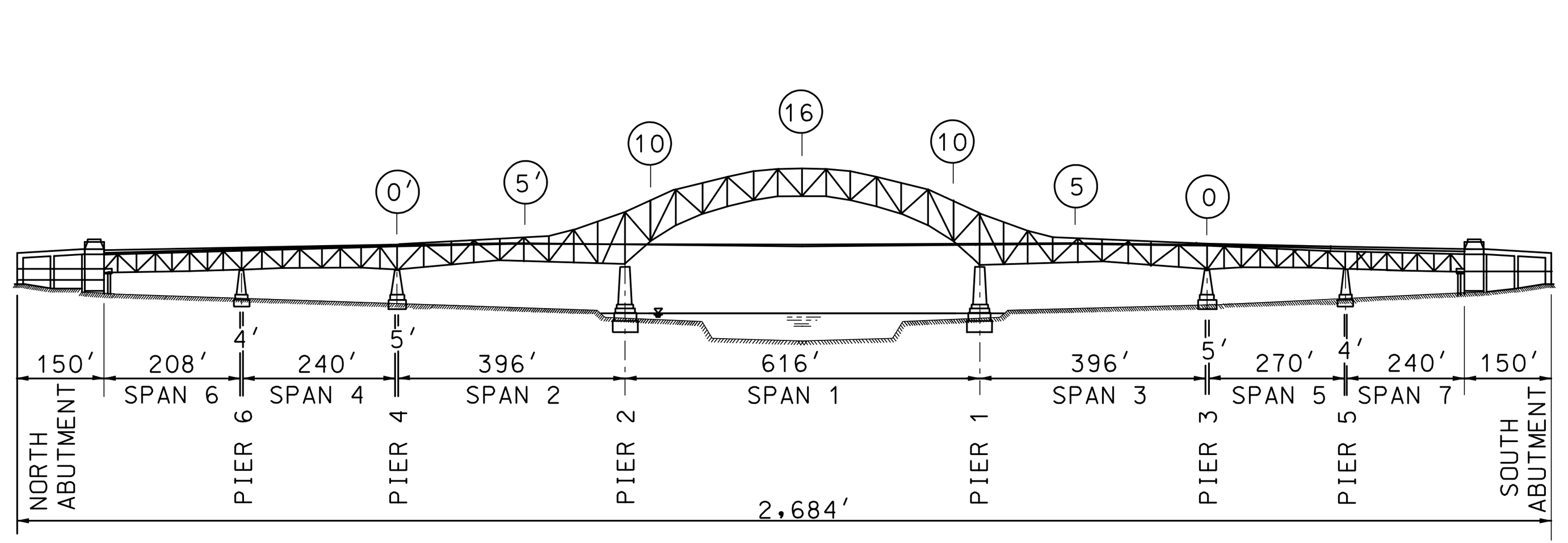
Date: February 2005
Rev.
Solicitation no. W912WJ-05-R-0004
Drawing code: CAP-105
File name: SBRs101.s05
Plot date: February 2005
Plot scale: 1" = 30'

Symbol	Description	Date	Appr.

CAPE COD CANAL
DECK REPAIRS AND PAVING
SAGAMORE AND BOURNE BRIDGES
BOURNE, MASSACHUSETTS

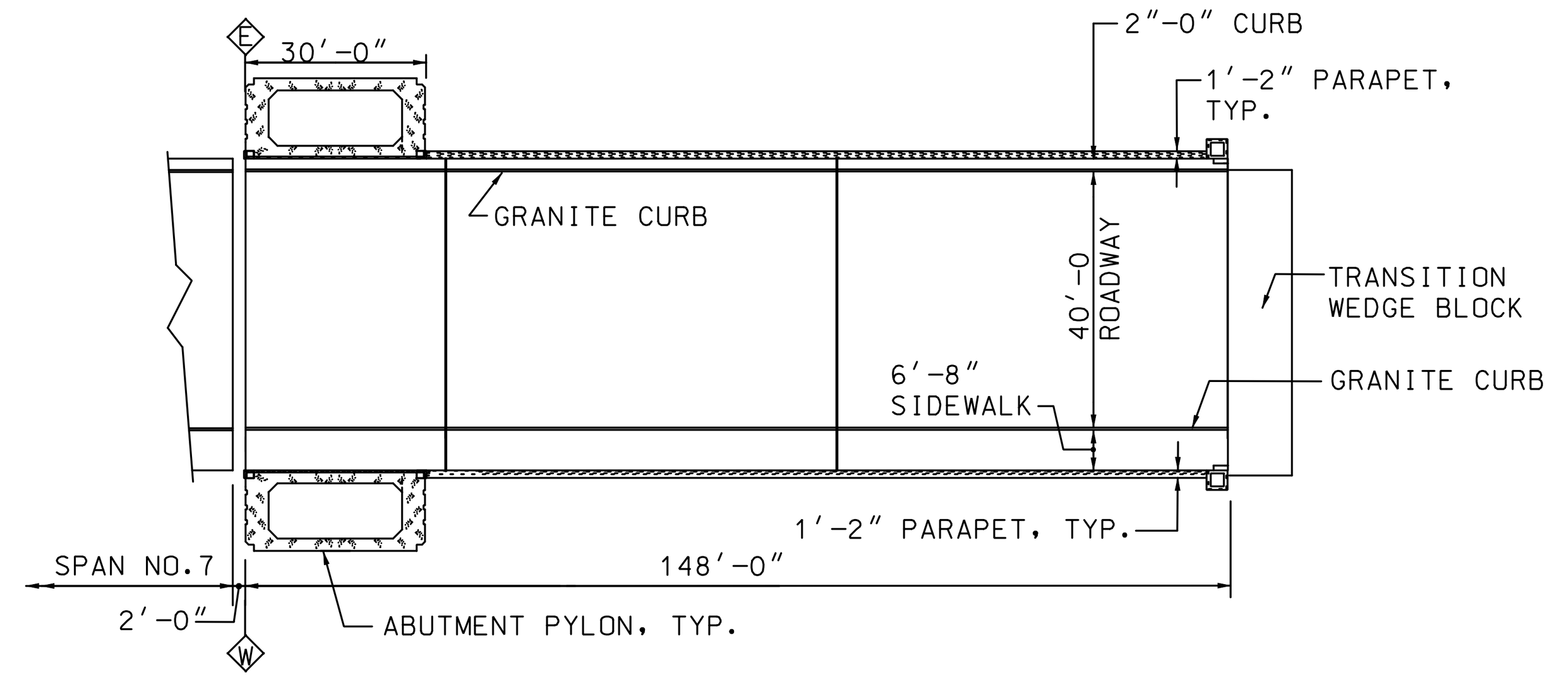
SAGAMORE BRIDGE DECK PLAN AND SEQUENCE OF WORK

Reference number:
S–1



BOURNE BRIDGE – WEST ELEVATION

N.T.S.



BOURNE SOUTH ABUTMENT PLAN

SCALE: 1" = 30'

SEQUENCE OF WORK:

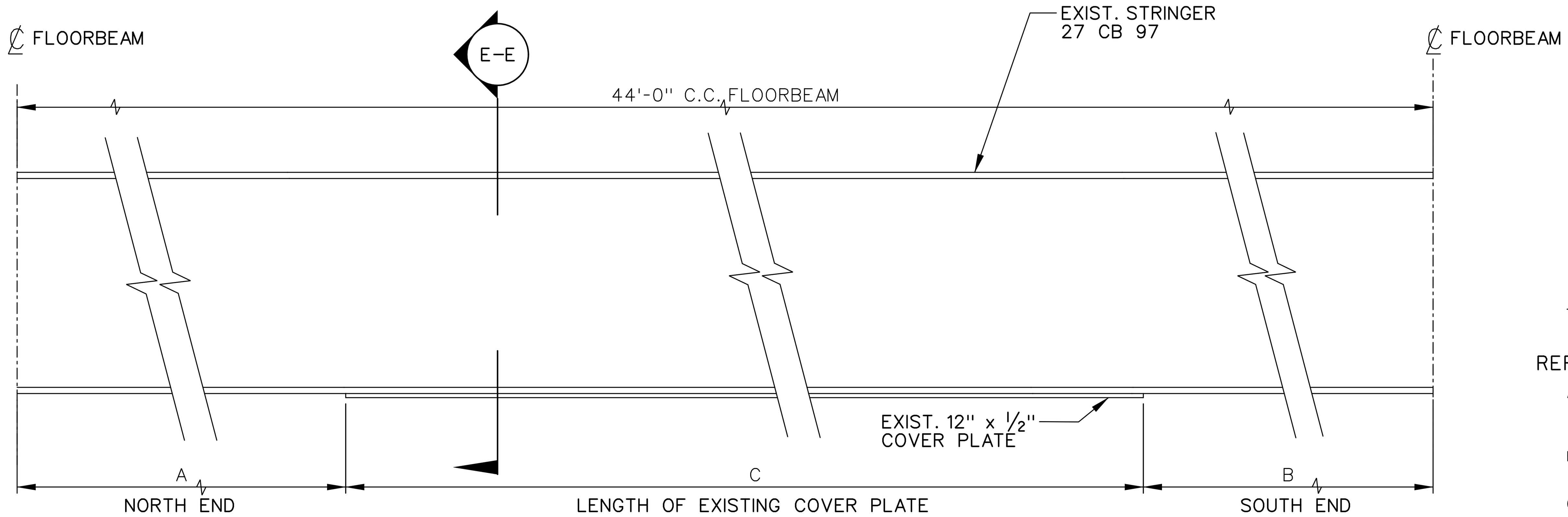
1. WORK ON THE BOURNE BRIDGE SHALL BE CONDUCTED AS INDICATED AFTER ALL WORK HAS BEEN COMPLETED AT THE SAGAMORE BRIDGE.
2. SEE SPECIFICATION SECTION 01110 FOR FURTHER INFORMATION REGARDING THE SEQUENCING OF CONSTRUCTION AND THE REQUIRED COMPLETION DATE FOR CONSTRUCTION.

PHASING OF WORK:

POST – SAGAMORE BRIDGE PHASE III WORK:

THIS WORK WILL REQUIRE CLOSURE OF THE CURB SIDE TRAFFIC LANE:

a. REMOVE 2" OF EXISTING PAVEMENT AND EXISTING MEMBRANE FROM THE EAST (CURB) SIDE OF THE SOUTH ABUTMENT. WIDTH OF REMOVAL SHALL BE 13'-6".
b. REPAIR ALL UNSOUND CONCRETE AND/OR EXISTING MEMBRANE WITHIN 148' x 13'-6" STRIP. APPROXIMATELY 160 SF OF CONCRETE REPAIR AREA WILL BE REQUIRED.
c. PROVIDE 2" OF ROSPHALT PAVEMENT ON THE ABUTMENT STRIP.
d. PROVIDE PAVEMENT MARKINGS (REFLECTORIZED PAINT) AS SPECIFIED.
e. TRAFFIC CONTROL SHALL BE AS SHOWN ON SHEET C-3.



SAGAMORE BRIDGE – STRINGER ELEVATION

SCALE: 1" = 1'-0"

STEEL REPAIRS – SAGAMORE BRIDGE

NO.	LOCATION	TYPE	CONSTRUCTION PHASE (IF REQUIRED)
1	BAY 10 – 11, STRINGER 9	A	I
2	BAY 11 –12, STRINGER 1	A	III
3	BAY 13 – 14, STRINGER 1	A	III
4	BAY 13' – 14', STRINGER 1	A	III
5	BAY 11' – 12', STRINGER 1	A	III
6	NORTH SIDE, FLOORBEAM 10	B	*
7	NORTH SIDE, FLOORBEAM 15'	B	*
8	BAY 9 – 10, STRINGER 2	C	*
9	BAY 9 – 10, STRINGER 1	C	*

* WORK CAN BE PERFORMED DURING ANY PHASE.

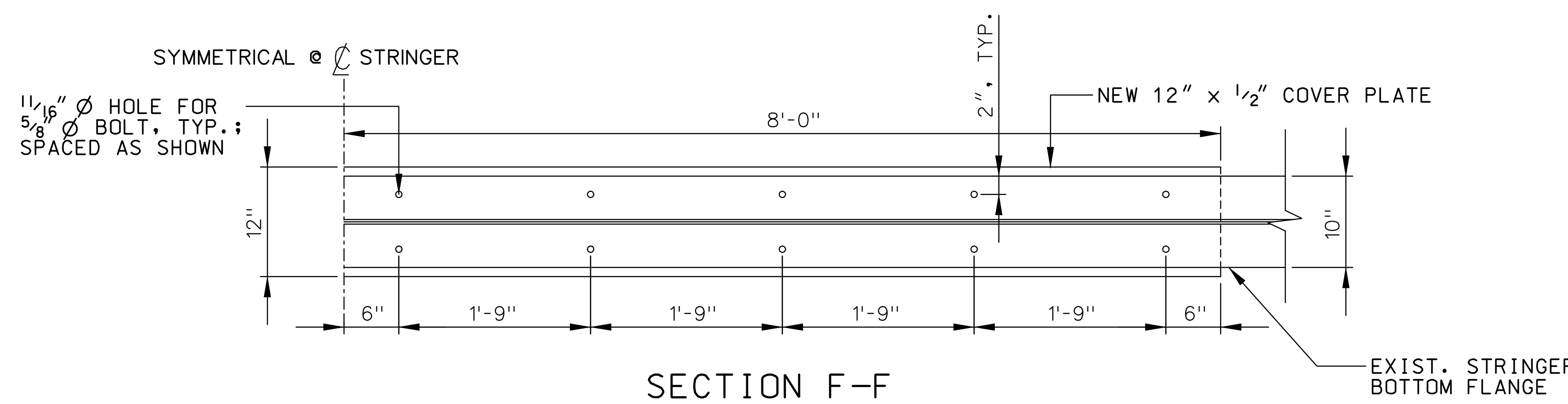
EXISTING DIMENSIONS			
STEEL REPAIR NOS. 1 – 5, TYPE A			
STEEL REPAIR NO.	A	B	C
1	20'	15'	9'
2	14'	14'	16'
3	13'-4"	14'-8"	16'
4	14'	14'	16'
5	14'	14'	16'

REPAIR TYPE:

A. WELDED COVER PLATE ON BOTTOM FLANGE OF STRINGER TO BE REMOVED AND REPLACED WITH NEW 12" x½" x 16-0" LONG BOLTED COVER PLATE, SYMMETRICAL ABOUT CENTERLINE OF FLOOR BEAM. CLEAN AND PAINT AS REQUIRED.
B. REMOVE WELDED GAS UTILITY SUPPORT BRACKET WITH CRACKED WELD, AND REPLACE WITH NEW BOLTED SUPPORT BRACKET. CLEAN AND PAINT AS REQUIRED.
C. REMOVE TWO BENT PLATES WELDED TO TOP OF STRINGER BOTTOM FLANGE. CLEAN AND PAINT AS REQUIRED.

NOTES:

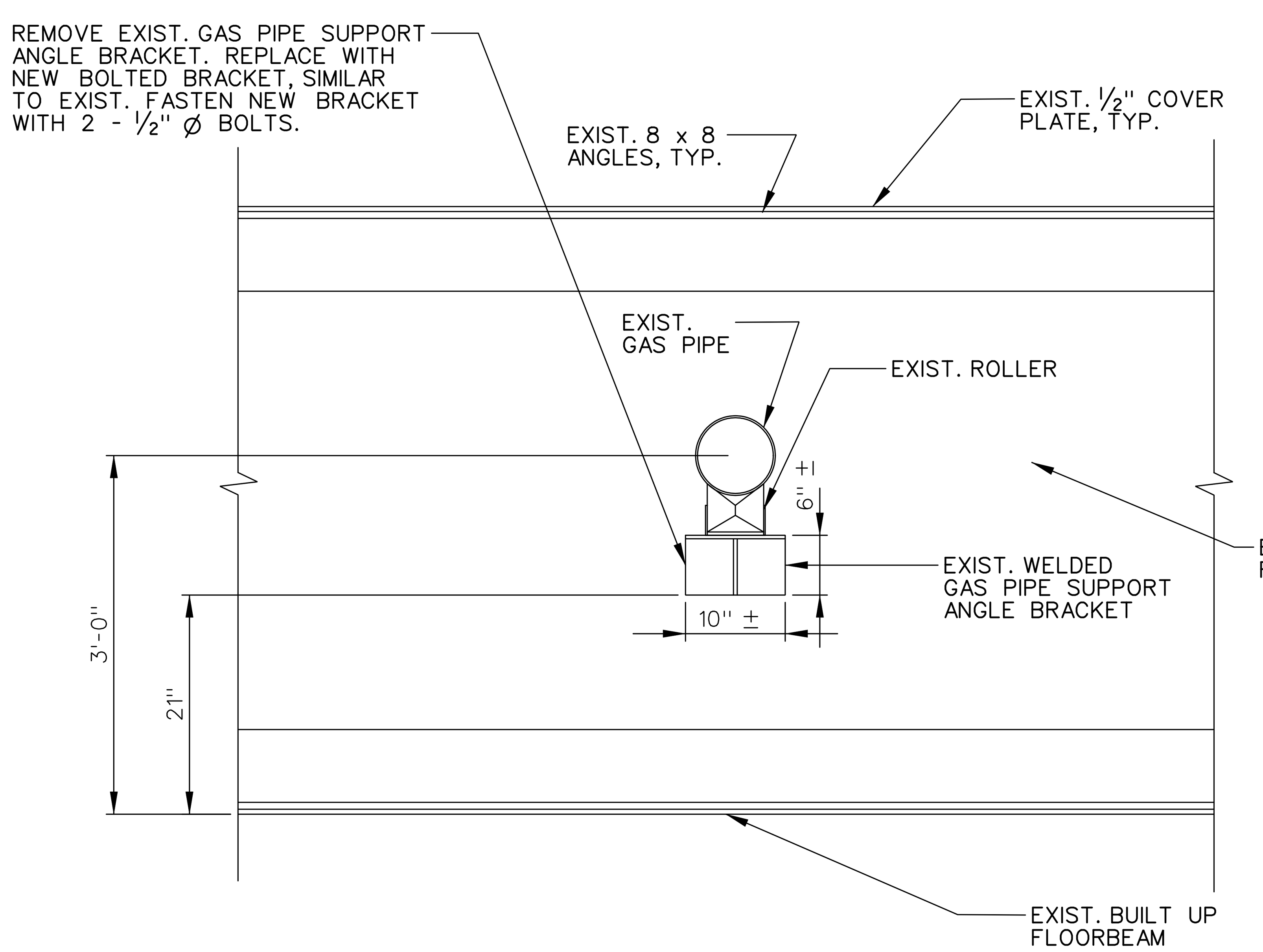
1. FOR DIMENSIONS A, B, C, SEE TABLE THIS SHEET.
2. ALL NEW BOLTS TO BE ASTM A 325.



SECTION F–F

STEEL REPAIR NOS. 1 – 5, TYPE A

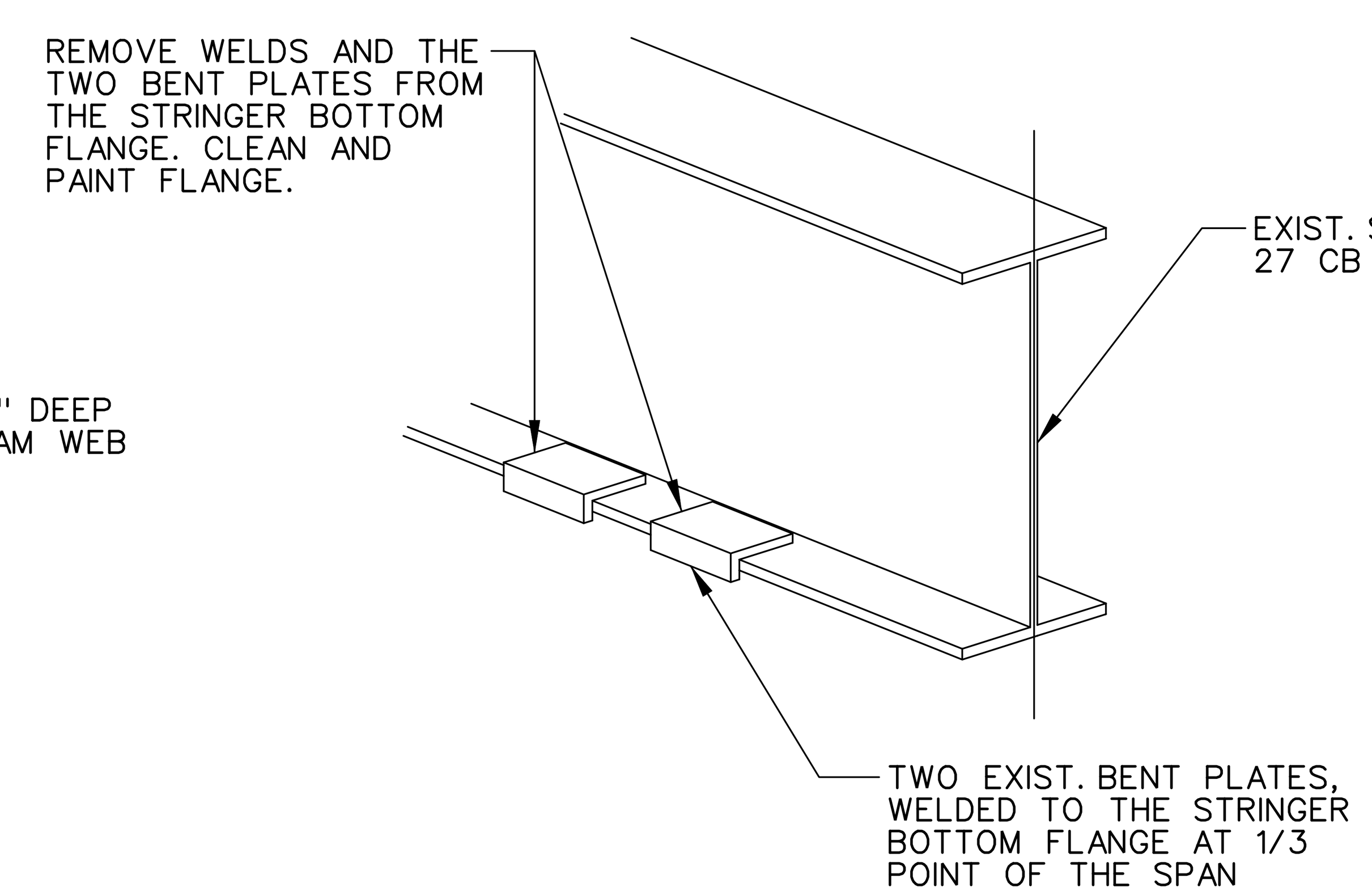
SCALE: 1" = 1'-0"



SAGAMORE BRIDGE – FLOORBEAM ELEVATION

STEEL REPAIR NOS. 6 & 7, TYPE B

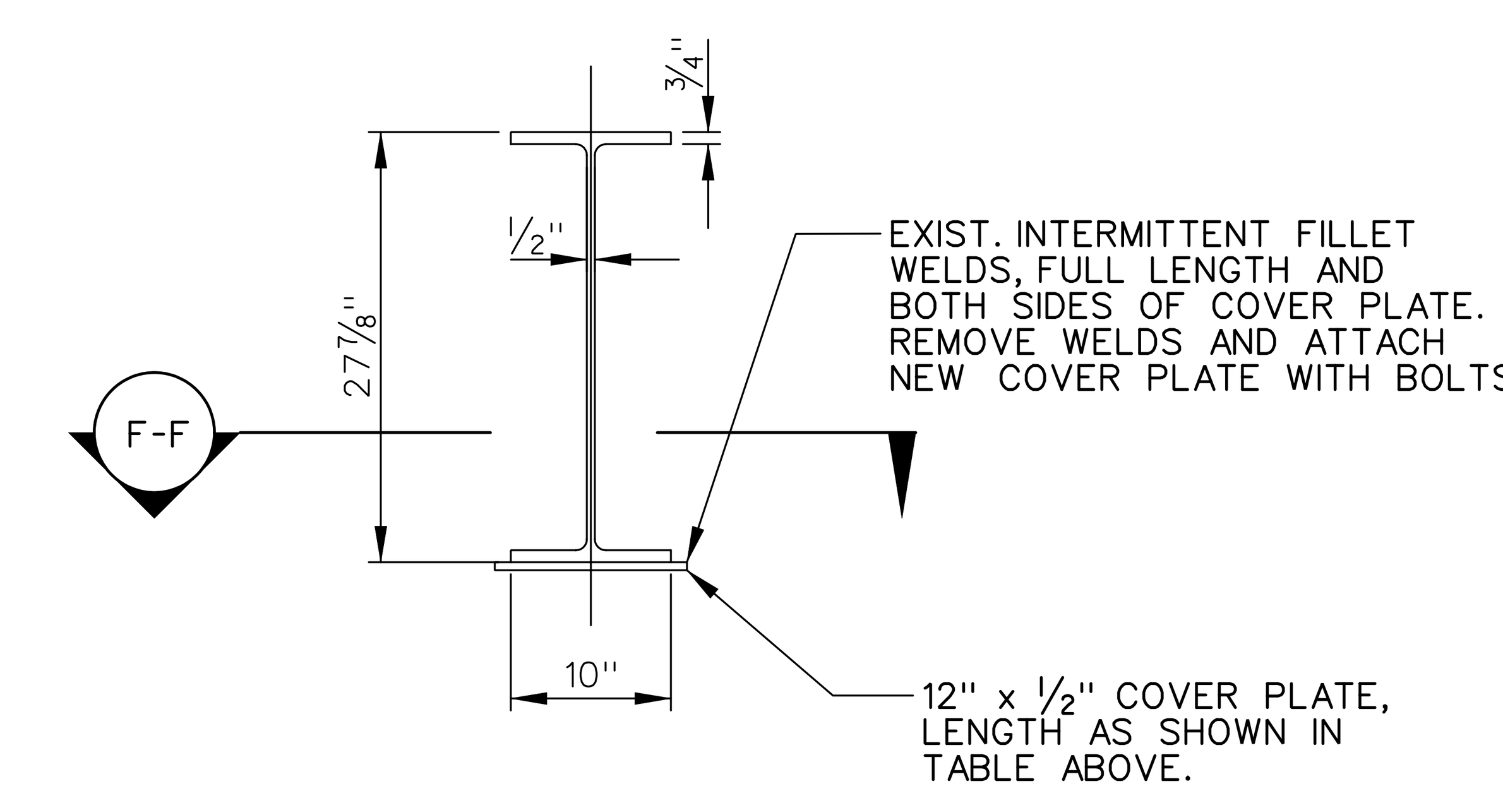
SCALE: 1" = 1'-0"



SAGAMORE BRIDGE – STRINGER ISOMETRIC

STEEL REPAIR NOS. 8 & 9, TYPE C

SCALE: 1" = 1'-0"



SECTION E–E

STEEL REPAIR NOS. 1 – 5, TYPE A

SCALE: 1" = 1'-0"

GRAPHIC SCALE:

1" = 30' — 30 0 30 60

1" = 1'-0" — 1' 0 1' 2'

US Army Corps of Engineers
New England District

Symbol	Description	Date	Appr.

Symbol	Description	Date	Appr.

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

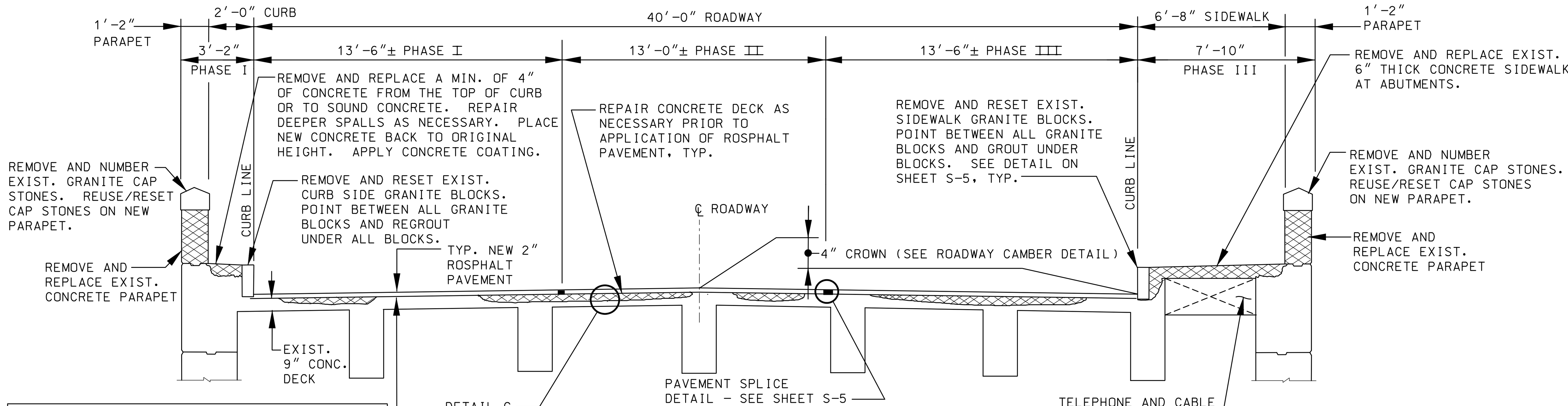
Designed by: Joseph A. Colucci
Drawn by: Jennifer Flanagan
Reviewed by: /s/ Jennifer Flanagan
Submitted by: /s/ Joseph A. Colucci, Team Leader, Technical Lead Unit

Date: February 2005
Rev.
Solicitation no. W912WJ-05-R-0004
Drawing code: CAP-105
File name: SBRs102.s06
Plot date: February 2005
Plot scale: 1" = 30'

CAPE COD CANAL
DECK REPAIRS AND PAVING
SAGAMORE AND BOURNE BRIDGES
BOURNE, MASSACHUSETTS

BOURNE BRIDGE DECK PLAN AND SEQUENCE OF WORK AND MISCELLANEOUS STEEL REPAIRS

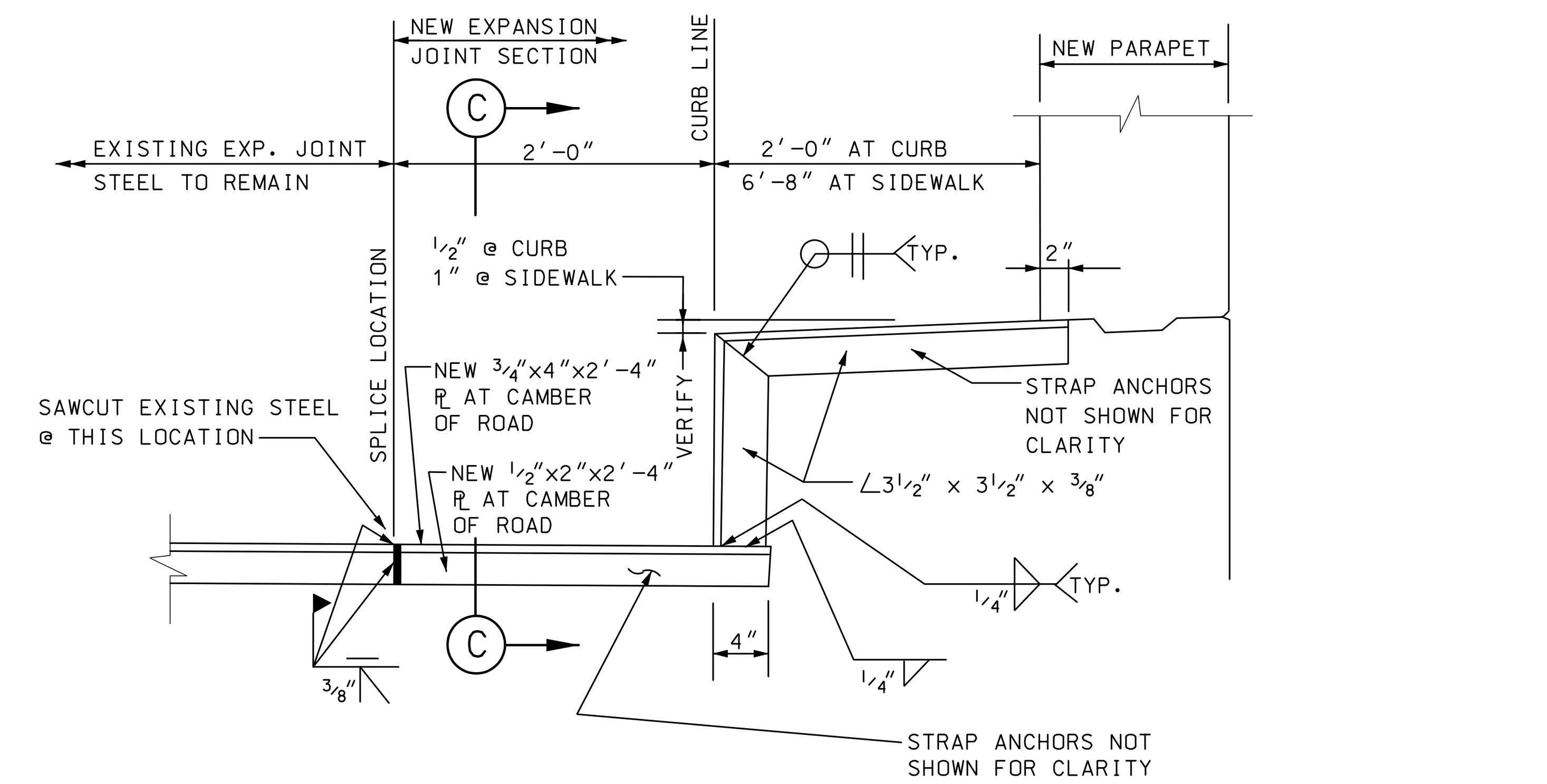
Reference number: S–2



NOTE:
THE EXISTING WEARING SURFACE ON THE SAGAMORE BRIDGE ABUTMENTS CONSISTS OF 5,000 PSI MICRO-SILICA CONCRETE. THE CONTRACTOR SHALL SCARIFY THE CONCRETE DOWN 2" TO ACCOMODATE THE NEW 2" ROSPHALT PAVEMENT WEARING SURFACE.

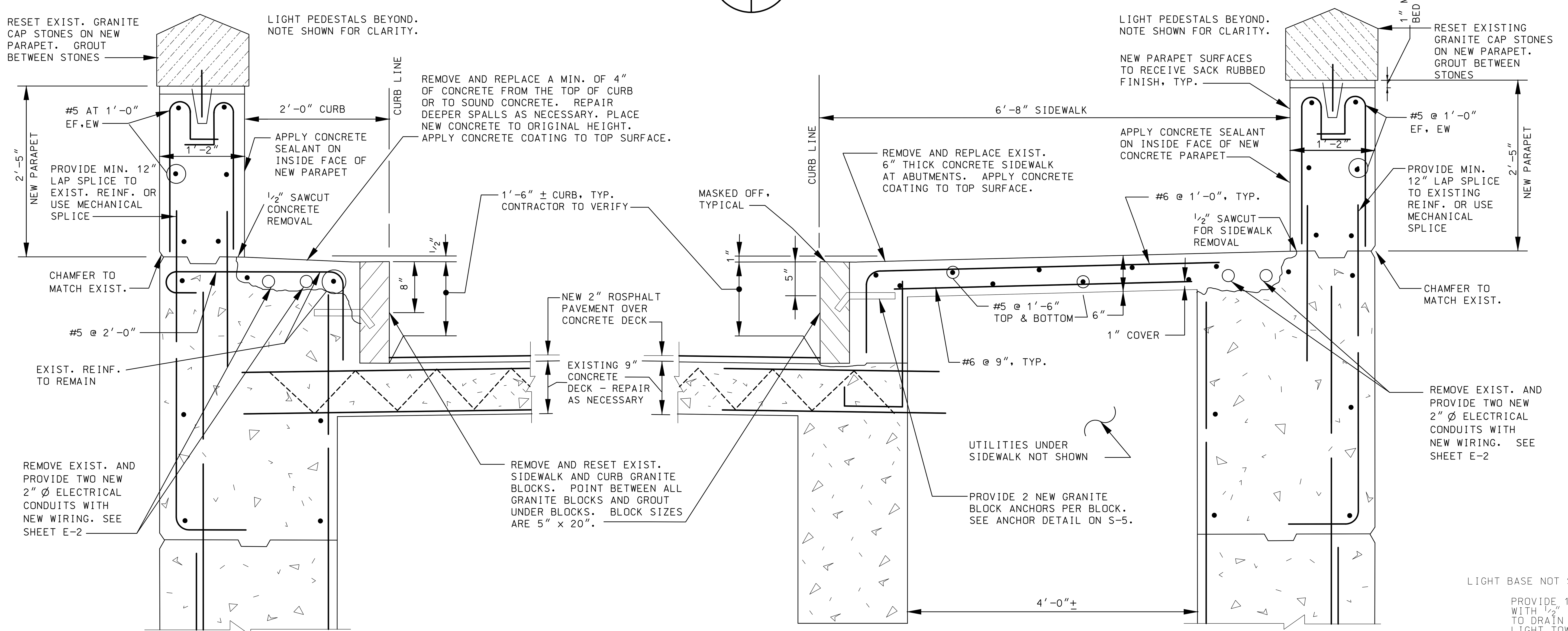
ABUTMENT DECK SECTION (A 5|7)

SCALE: 1/4"=1'-0"



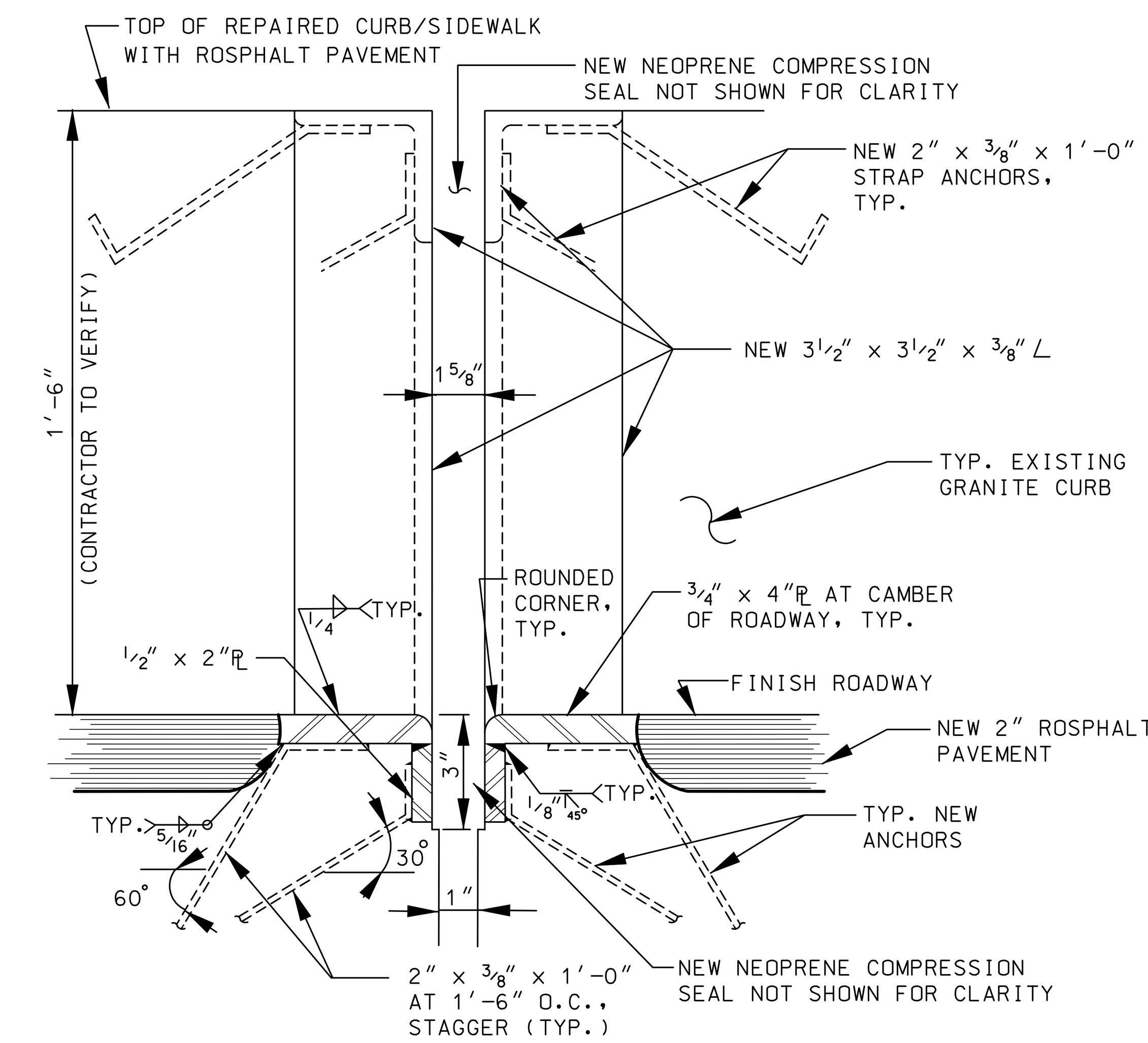
ABUTMENT EXPANSION JOINT REPAIR DETAIL - COMPRESSION SEAL

SCALE: 1" = 1'-0"



ABUTMENT DETAILS

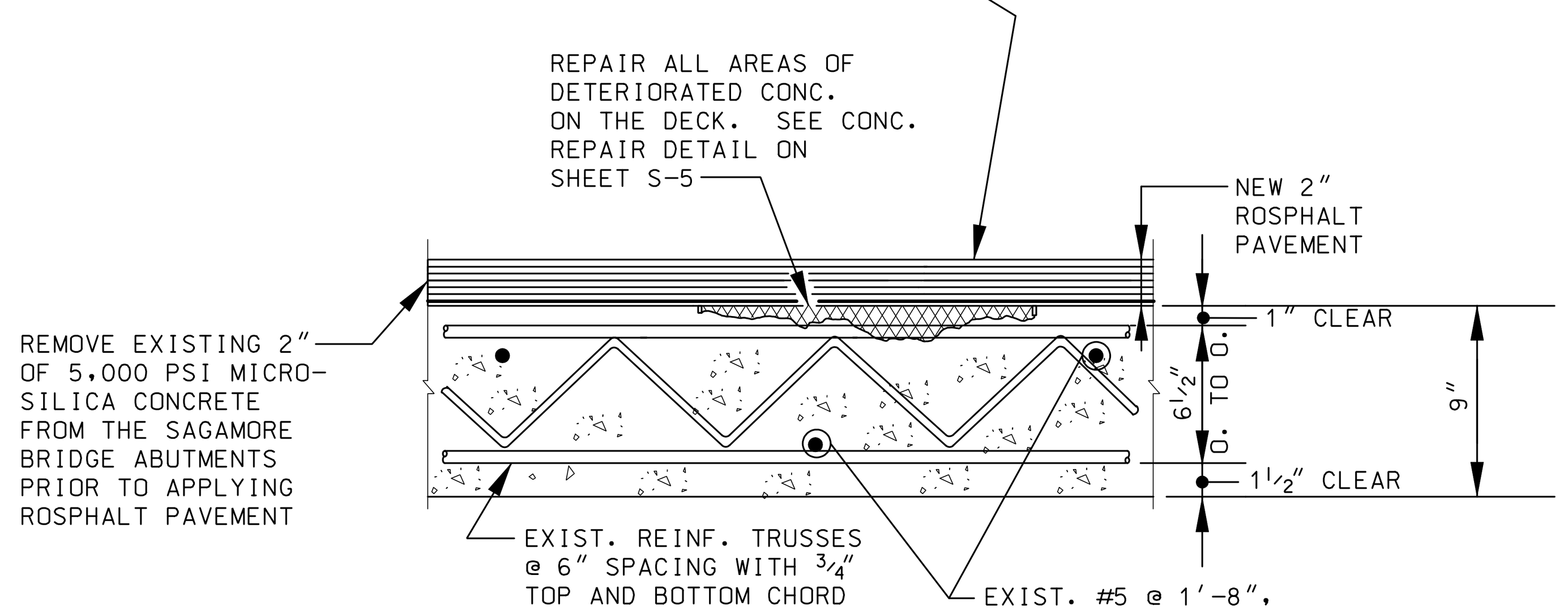
SCALE: 1"=1'-0"



SECTION (C 5,7|7)

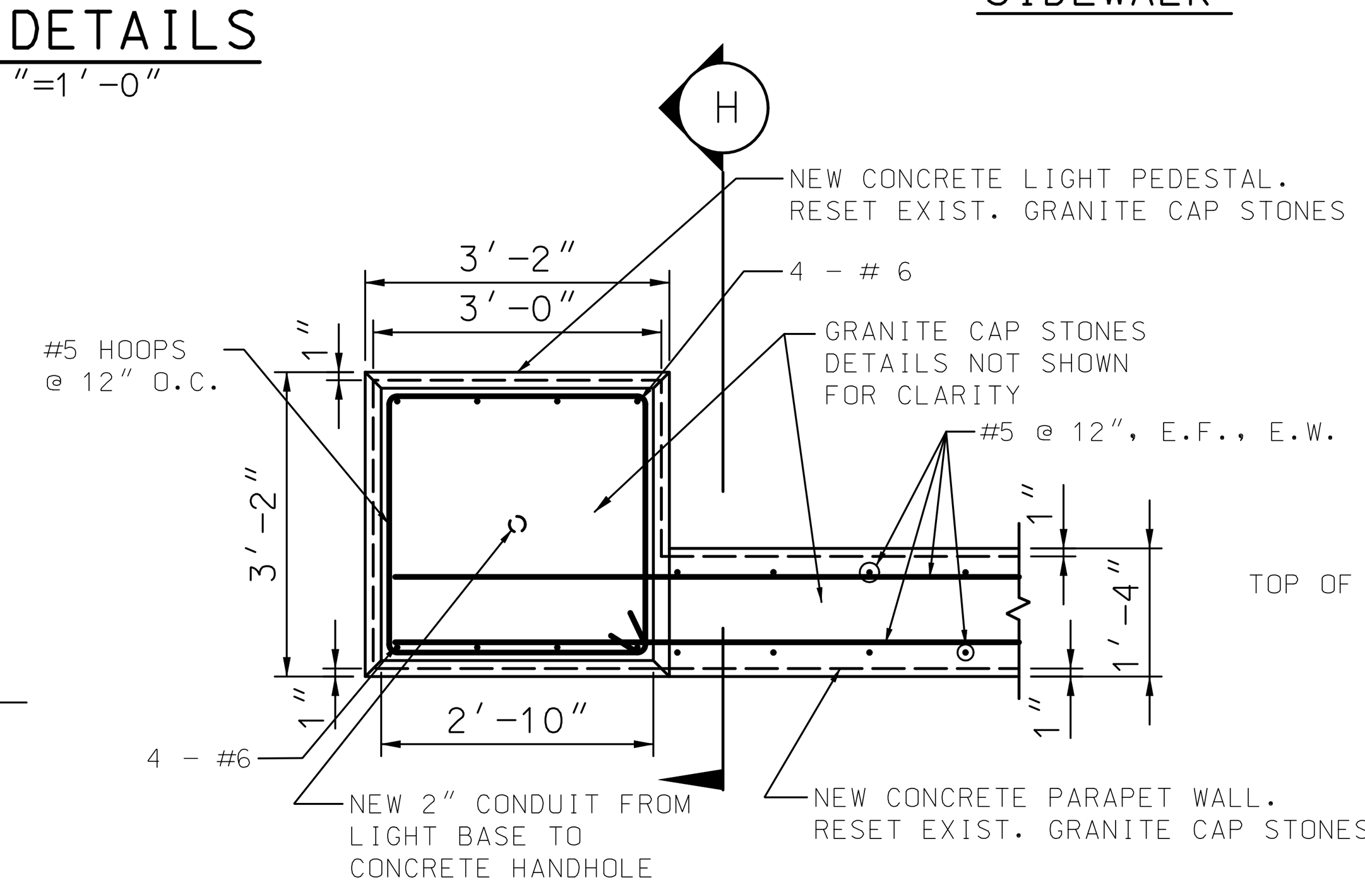
SCALE: 3" = 1'-0"

NOTE:
THE EXISTING WEARING SURFACE ON THE SAGAMORE BRIDGE ABUTMENTS CONSISTS OF 5,000 PSI MICRO-SILICA CONCRETE. THE CONTRACTOR SHALL SCARIFY THE CONCRETE DOWN 2" TO ACCOMODATE THE NEW 2" ROSPHALT PAVEMENT WEARING SURFACE.

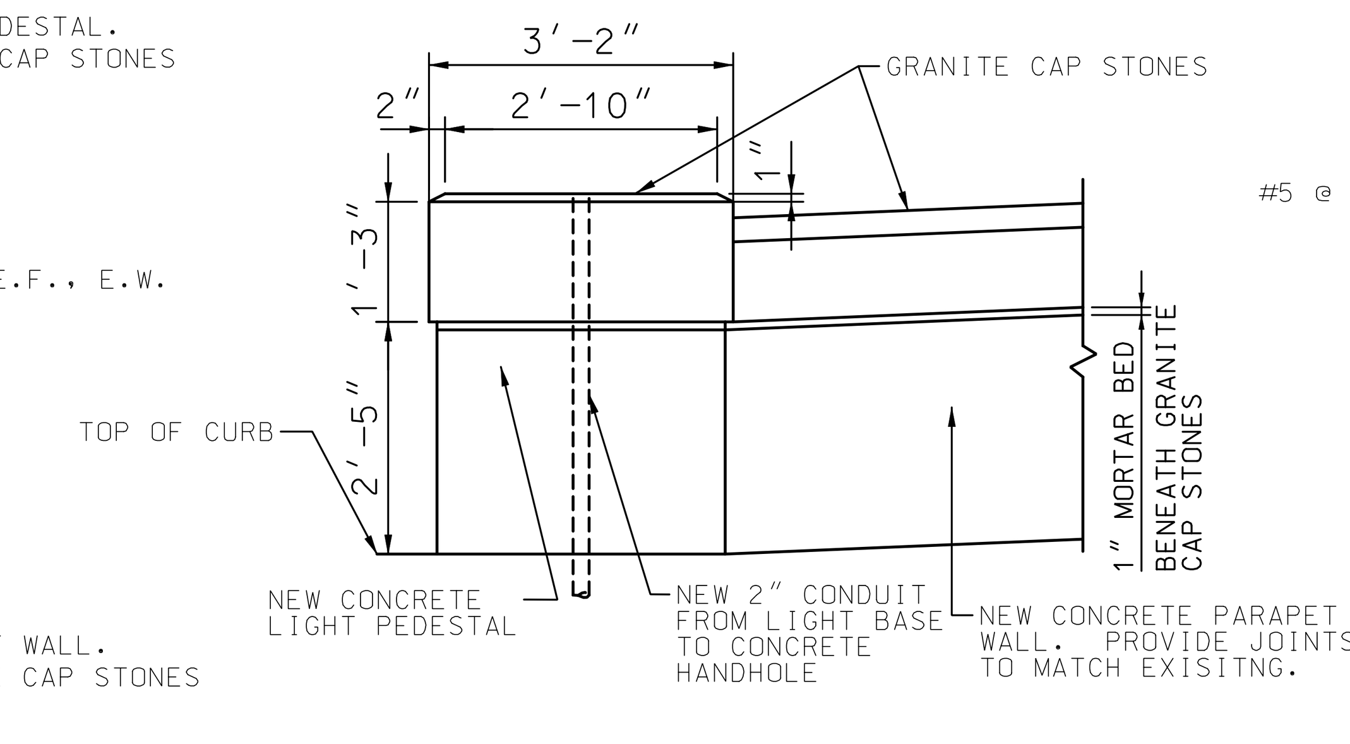


DETAIL G - NEW DECK SECTION

SCALE: 1 1/2" = 1'-0"



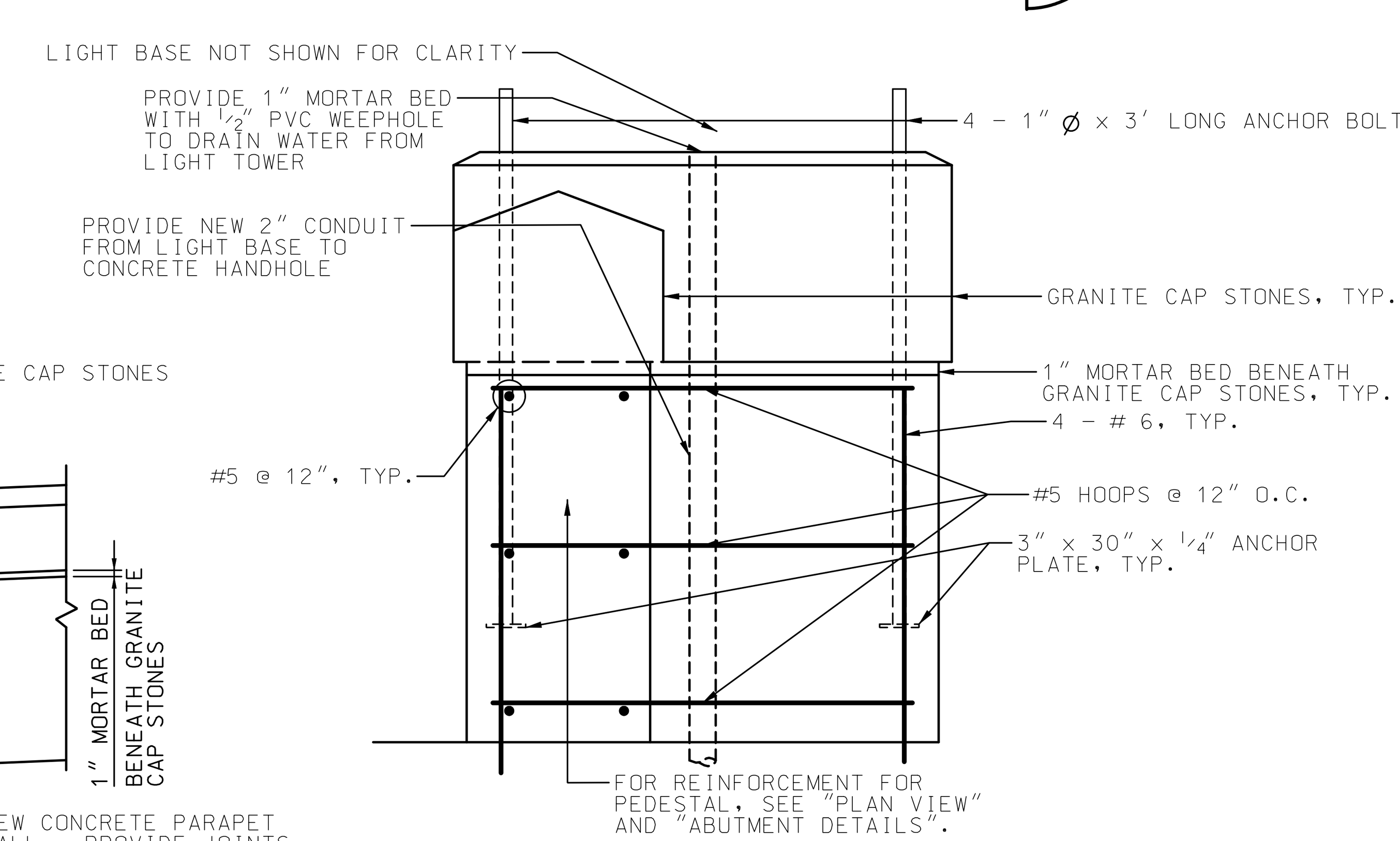
PLAN



ELEVATION

NEW LIGHT PEDESTAL & NEW PARAPET WALL

SCALE: 1/2" = 1'-0"



SECTION H

SCALE: 1" = 1'-0"

SCALE: 1"=1'-0" 1' 0 1' 2'
SCALE: 3"= 1'-0" 3" 0 3" 6" 9"
SCALE: 1/4"=1'-0" 4' 0 4' 8'
SCALE: 1 1/2"= 1'-0" 12" 9" 6" 3" 0 6" 12"

US Army Corps of Engineers
New England District

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U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

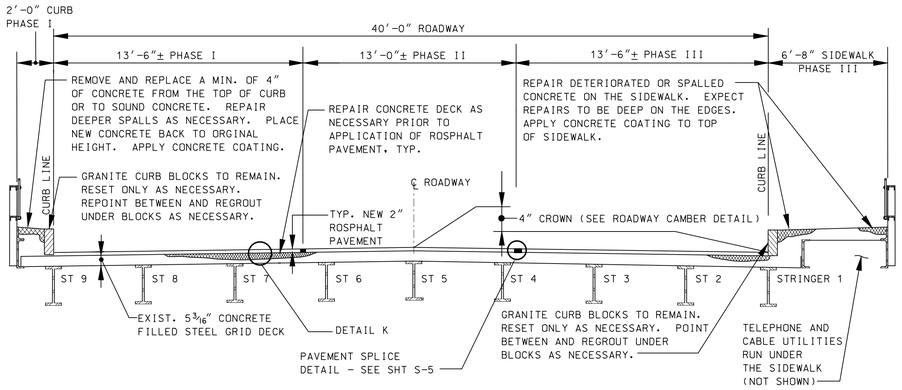
Designed by: Joseph A. Colucci
Drawn by: Jennifer Flanagan
Reviewed by: /s/ Jennifer Flanagan
Submitted by: /s/ Joseph A. Colucci, Team Leader, Technical Lead Unit

Date: February 2005
Rev.
Solicitation no. W912WJ-05-R-0004
Drawing code: CAP-105
File name: SBRs503.s07
Plot date: February 2005
Plot scale: 1" = 1'-0"

CAPE COD CANAL
DECK REPAIRS AND PAVING
SAGAMORE AND BOURNE BRIDGES
BOURNE, MASSACHUSETTS

SAGAMORE ABUTMENT REPAIR SECTIONS AND DETAILS

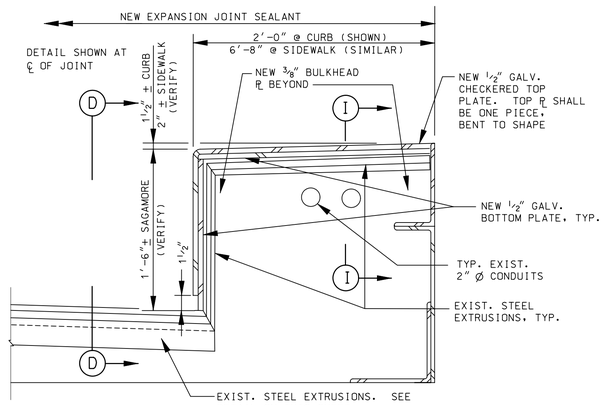
Reference number: S-3



BRIDGE DECK SECTION

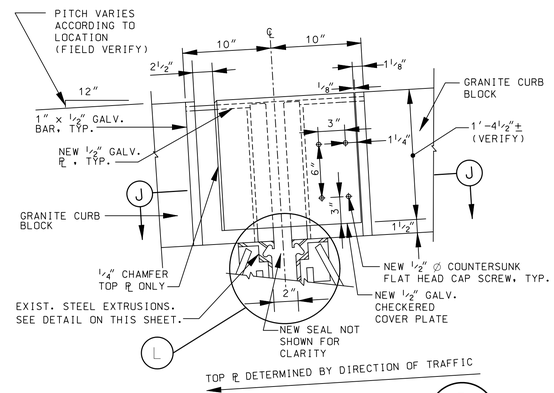
SCALE: 1/4″ = 1′-0″

B 5 | 8



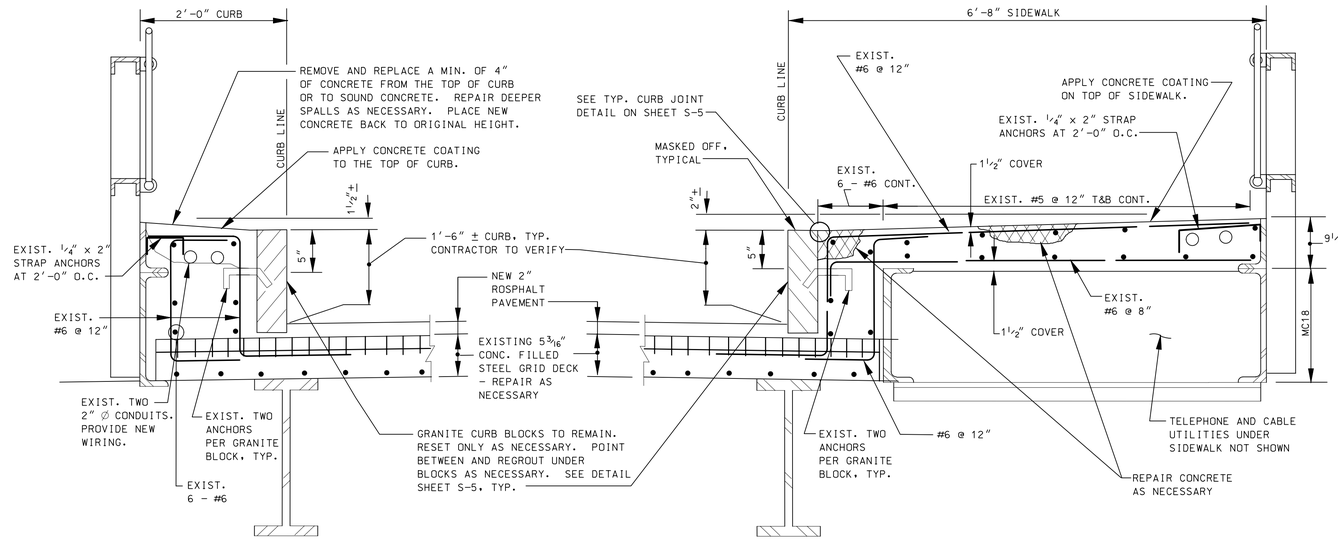
BRIDGE EXPANSION JOINT REPAIR DETAIL PANEL POINTS 10 & 10′

SCALE: 1 1/2″ = 1′-0″



SECTION

SCALE: 1 1/2″ = 1′-0″ 5,8 | D 8

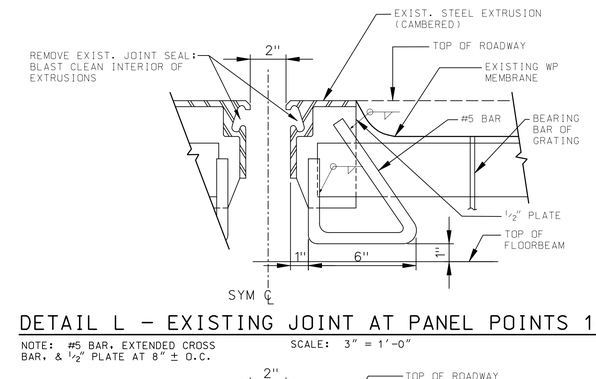


CURB SIDE

SIDEWALK SIDE

BRIDGE DETAILS

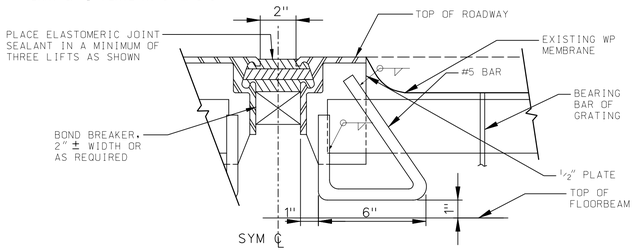
SCALE: 1″ = 1′-0″



DETAIL L - EXISTING JOINT AT PANEL POINTS 10 & 10′

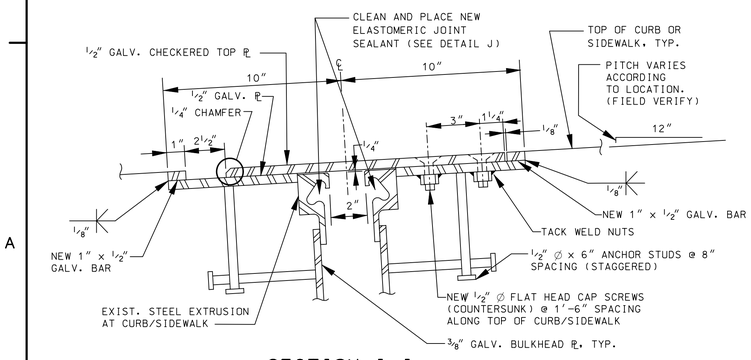
NOTE: #5 BAR, EXTENDED CROSS BAR, & 1/2″ PLATE AT 8″ ± O.C.

SCALE: 3″ = 1′-0″



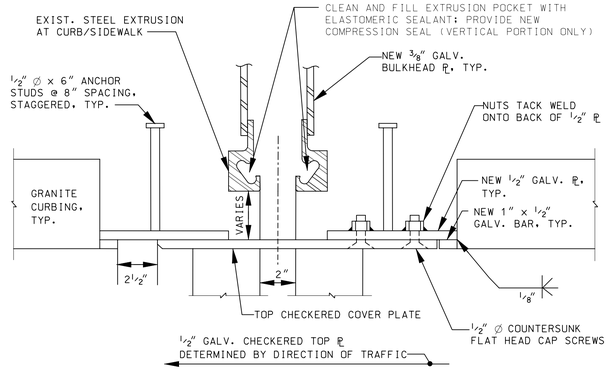
DETAIL L - NEW JOINT AT PANEL POINTS 10 & 10′

SCALE: 3″ = 1′-0″



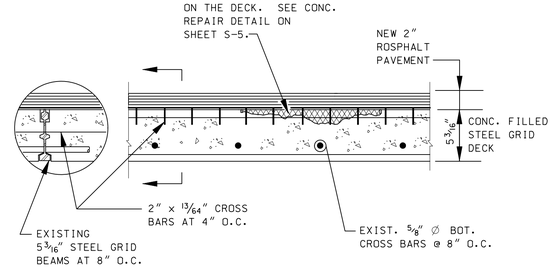
SECTION I-I

SCALE: 3 ″ = 1′-0″



SECTION J-J

SCALE: 3″ = 1′-0″



DETAIL K - NEW DECK SECTION

SCALE: 1 1/2″ = 1′-0″

SCALE: 1/4″ = 1′-0″ 4′ 0 4′ 8′

SCALE: 1″ = 1′-0″ 1′ 0 1′ 2′

SCALE: 1 1/2″= 1′-0″ 12″ 9″ 6″ 3″ 0 6″ 12″

SCALE: 3″ = 1′-0″ 3″ 0 3″ 6″ 9″

US Army Corps of Engineers
New England District

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Date: February 2005
Rev:
Solicitation no. W912WJ-05-R-0004
Drawing code: CAP-105
File name: SBR450x.dgn
Plot date: February 2005

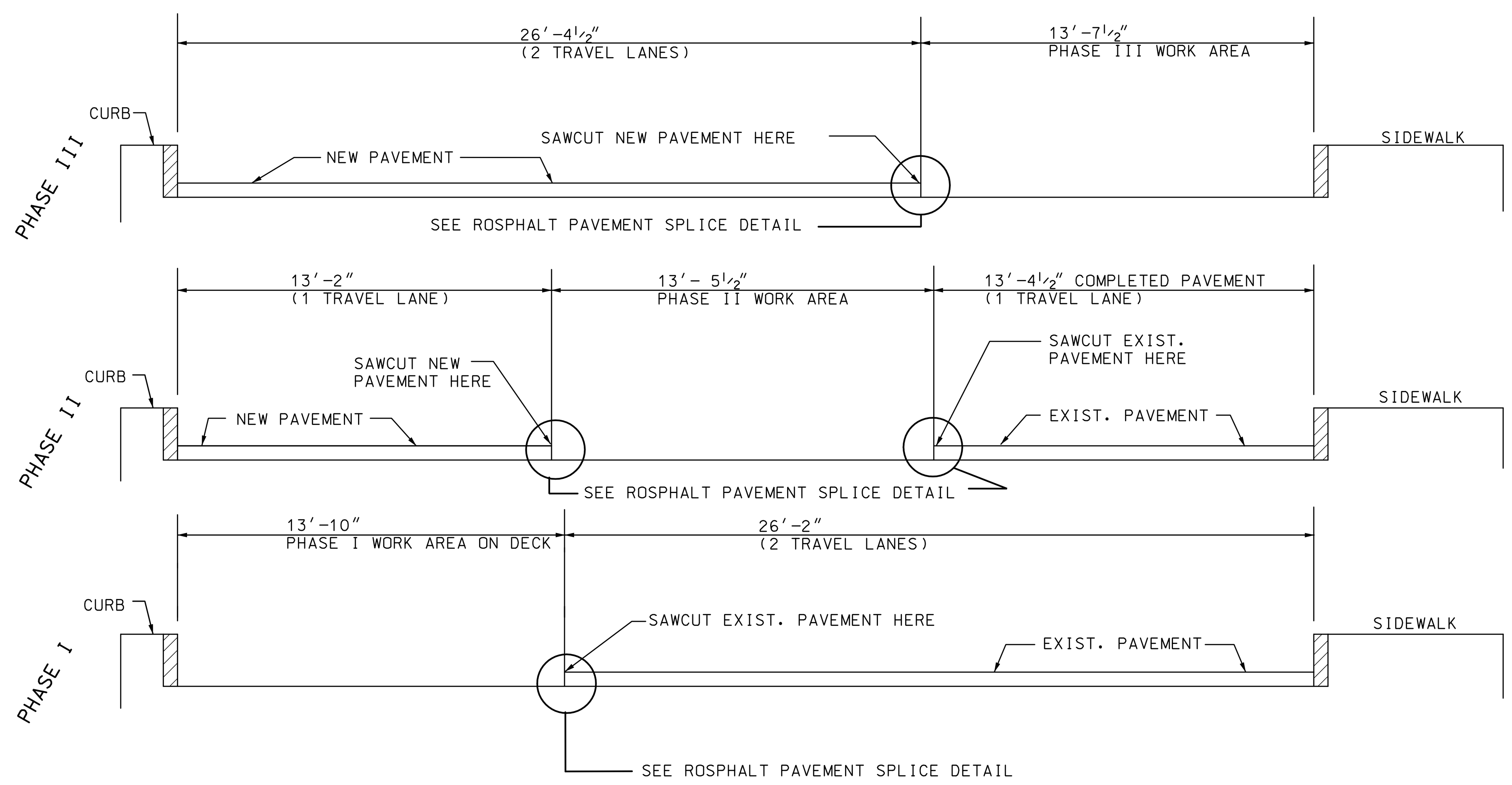
Designed by: Joseph A. Colucci
Drawn by: Jennifer Flanagan
Reviewed by: Submitted by: Tim Flanagan
/s/ Joseph A. Colucci
Team Leader, Technical Lead Unit

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

CAPE COD CANAL
DECK REPAIRS AND PAVING
SAGAMORE AND BOURNE BRIDGES
BOURNE, MASSACHUSETTS

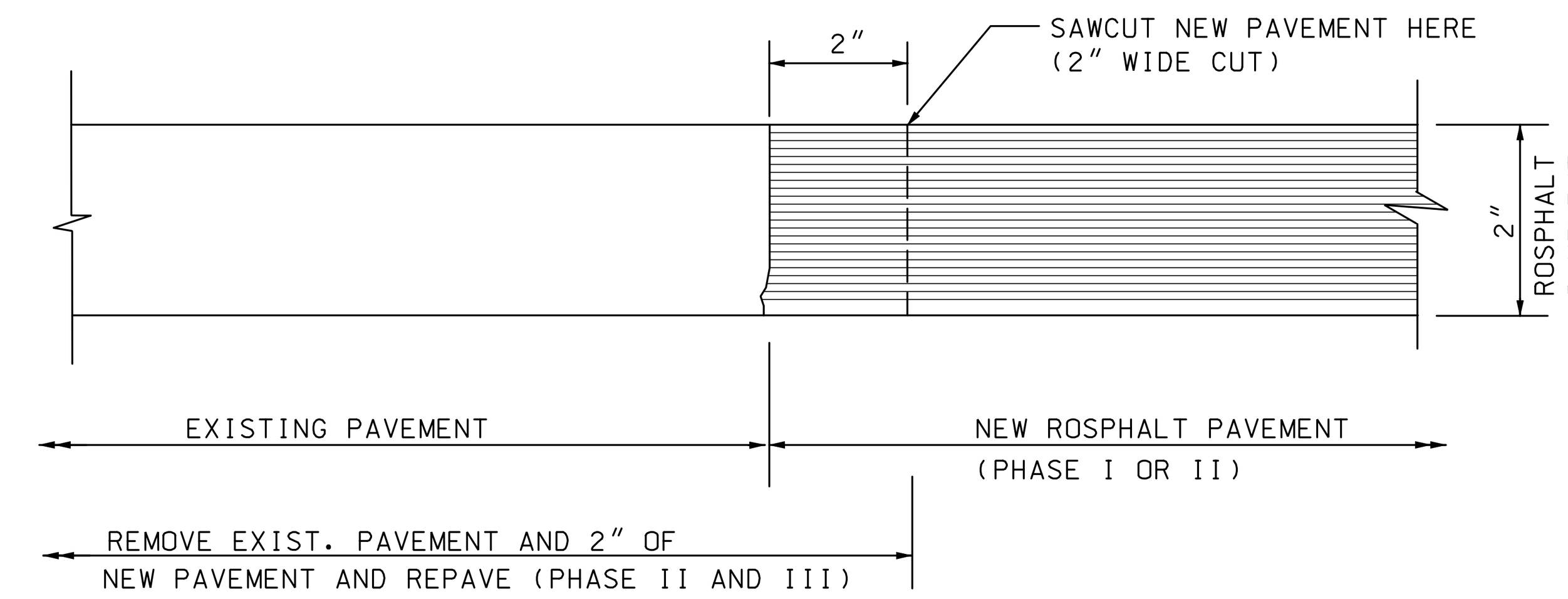
SAGAMORE BRIDGE REPAIR SECTIONS AND DETAILS

Reference number:
S-4
Sheet 8 of 11



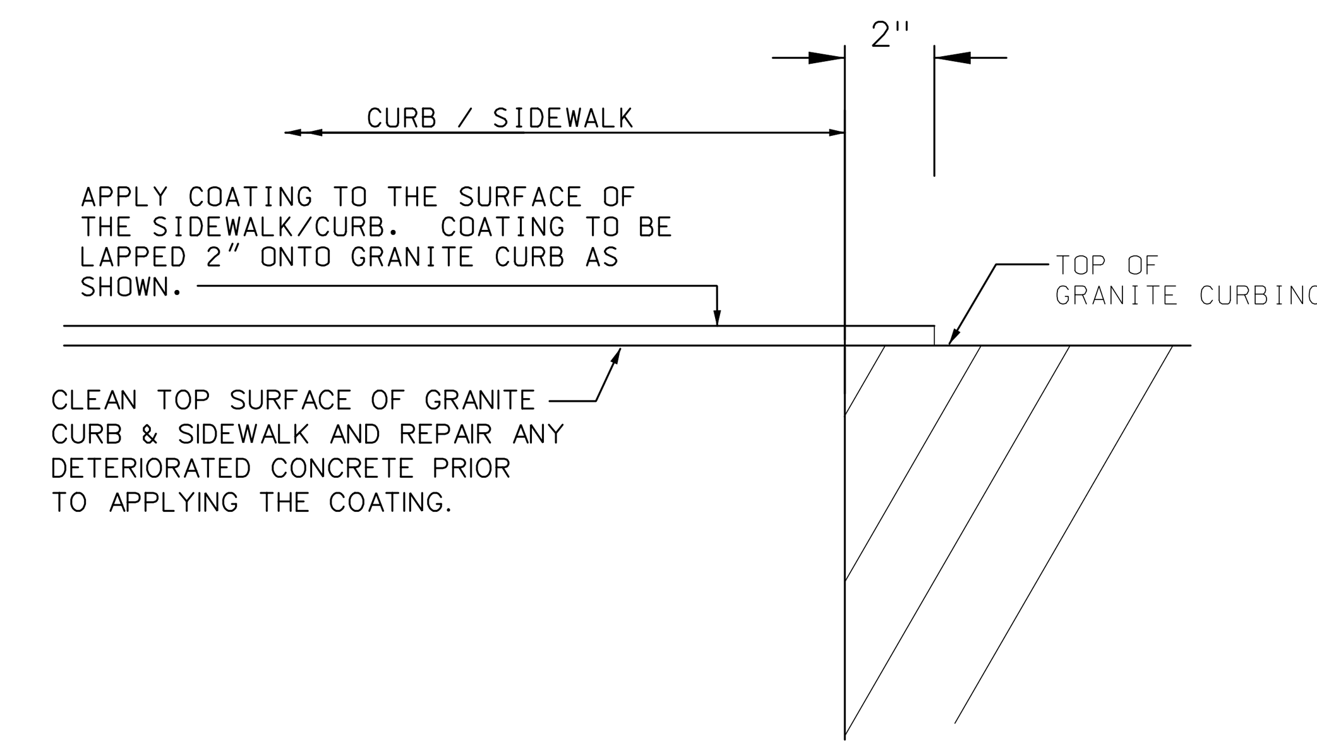
ROSPHALT PAVEMENT CONSTRUCTION SEQUENCE

(NOTE: ROADWAY CAMBER NOT SHOWN)
SCALE: ¼" = 1'-0"



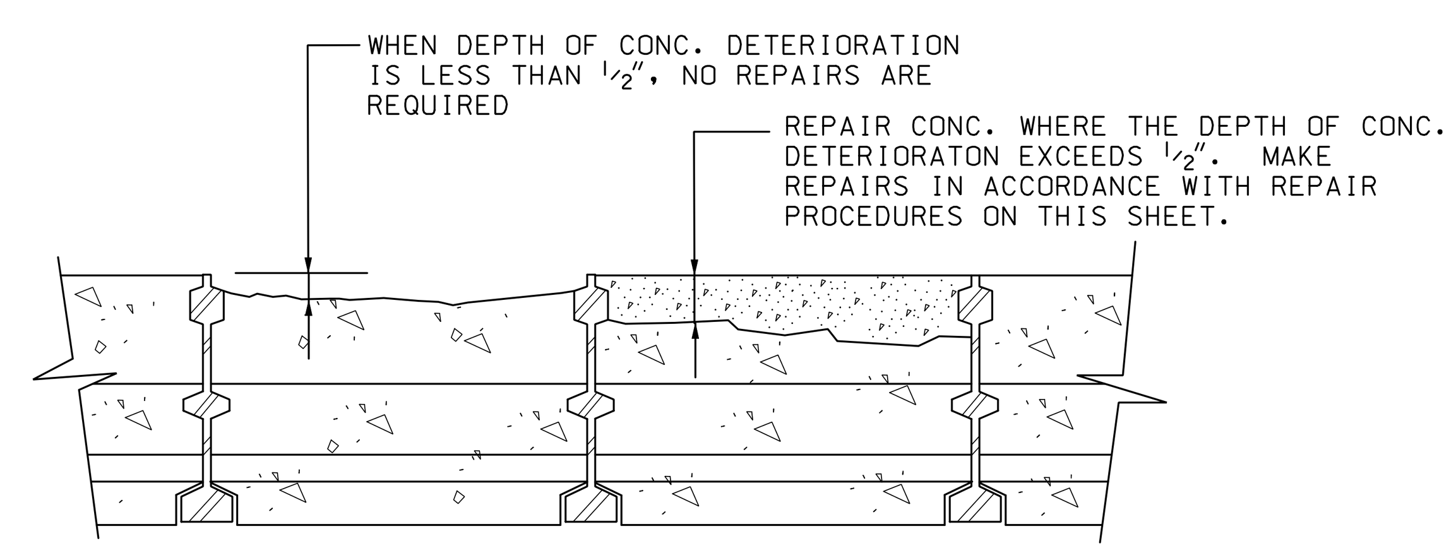
ROSPHALT PAVEMENT SPLICE DETAIL

SCALE: 6 "=1'-0"



TYPICAL SIDEWALK/CURB JOINT DETAIL

N.T.S.



BRIDGE DECK REPAIR DETAIL

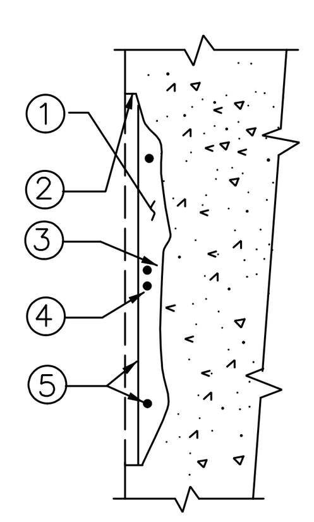
SCALE: 3" = 1'-0"

CONCRETE REPAIR PROCEDURES

1. REMOVE ALL LOOSE, DETERIORATED CONCRETE IN ORDER TO OBTAIN AN AGGREGATE-FRACTURED SURFACE. REPAIR AREA SHALL BE A MINIMUM 1" DEEP (EXCEPT ON BRIDGE DECK WITH STEEL GRID).
2. SAW CUT ALL EDGES AT 90 DEGREES TO A MINIMUM DEPTH OF ¾" (EXCEPT AT GRID LOCATIONS) BEING CAREFUL NOT TO CUT ANY REINFORCING.
3. WHERE REINFORCING IS EXPOSED MORE THAN 50% OF ITS CIRCUMFERENCE, REMOVE CONCRETE A MINIMUM OF 1" BEHIND THE BAR.
4. WHERE MORE THAN 25% OF A REINFORCING BAR IS DETERIORATED, PROVIDE A NEW BAR WITH ADEQUATE SPLICE LENGTH.
5. CLEAN EXPOSED BARS AND APPLY CORROSION INHIBITOR/ BONDING AGENT
6. REPAIR AREA SHALL BE SATURATED SURFACE DRY WITH NO STANDING WATER IMMEDIATELY PRIOR TO PLACEMENT OF THE CONCRETE OR REPAIR MORTAR.
7. PROVIDE NEW CONCRETE OR REPAIR MORTAR AS SPECIFIED, ACCORDING TO THE FOLLOWING REPAIR DEPTHS:

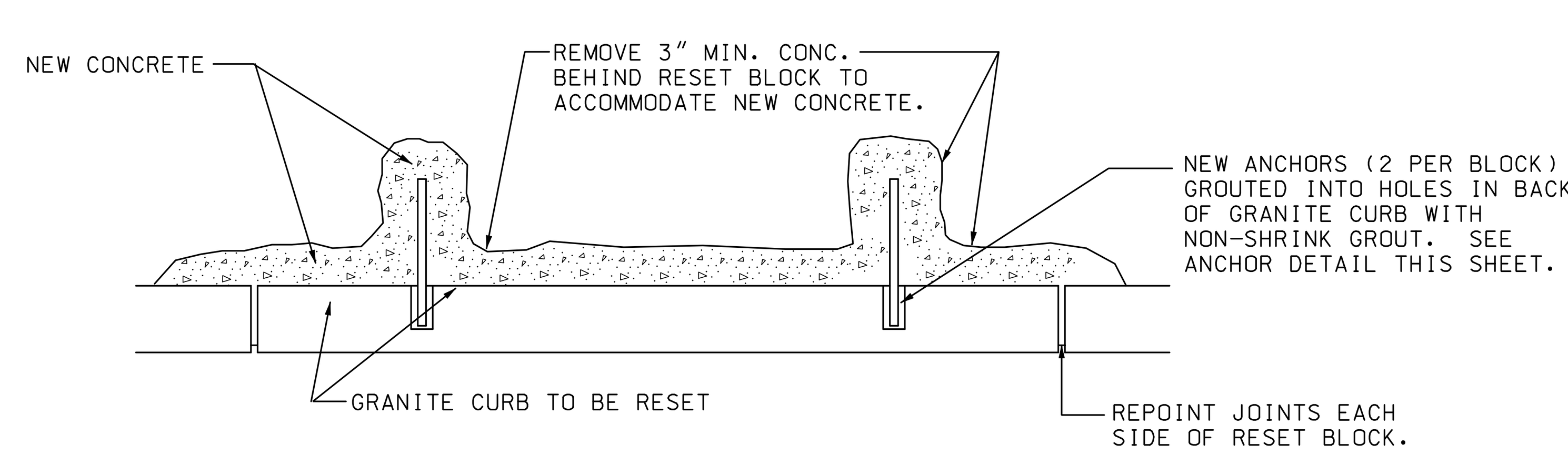
REPAIR TYPE	REPAIR DEPTH	MATERIAL	NOTES:
R-1	d>2"	CONCRETE	REMOVE UNSOUND CONCRETE TO 3" MIN. DEPTH. WHERE NO EXPOSED STEEL IS ENCOUNTERED, PROVIDE ¼" Ø PINS AT 1'-0" SPACING WITH 3x3 W2xW2 WWF (TYP).
R-2	1"< d <2"	REPAIR MORTAR	USE ¼" Ø PINS AT 1'-0" SPACING ONLY.
R-2	d<1"	REPAIR MORTAR, EXPOXY RESIN MORTAR	

8. CURE AS SPECIFIED. FINISH TO MATCH EXISTING.



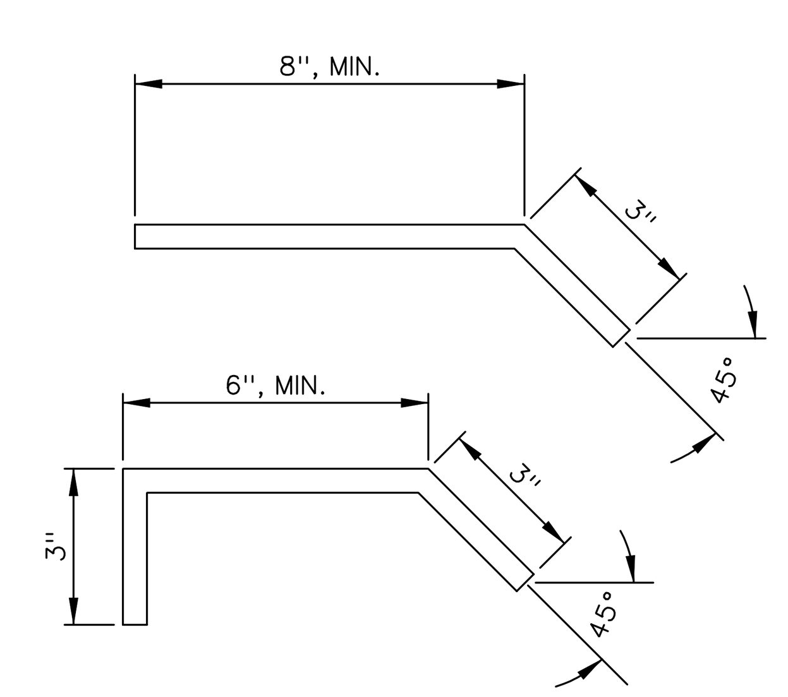
TYPICAL CONCRETE REPAIR DETAIL

N.T.S.



RESET GRANITE CURB DETAIL

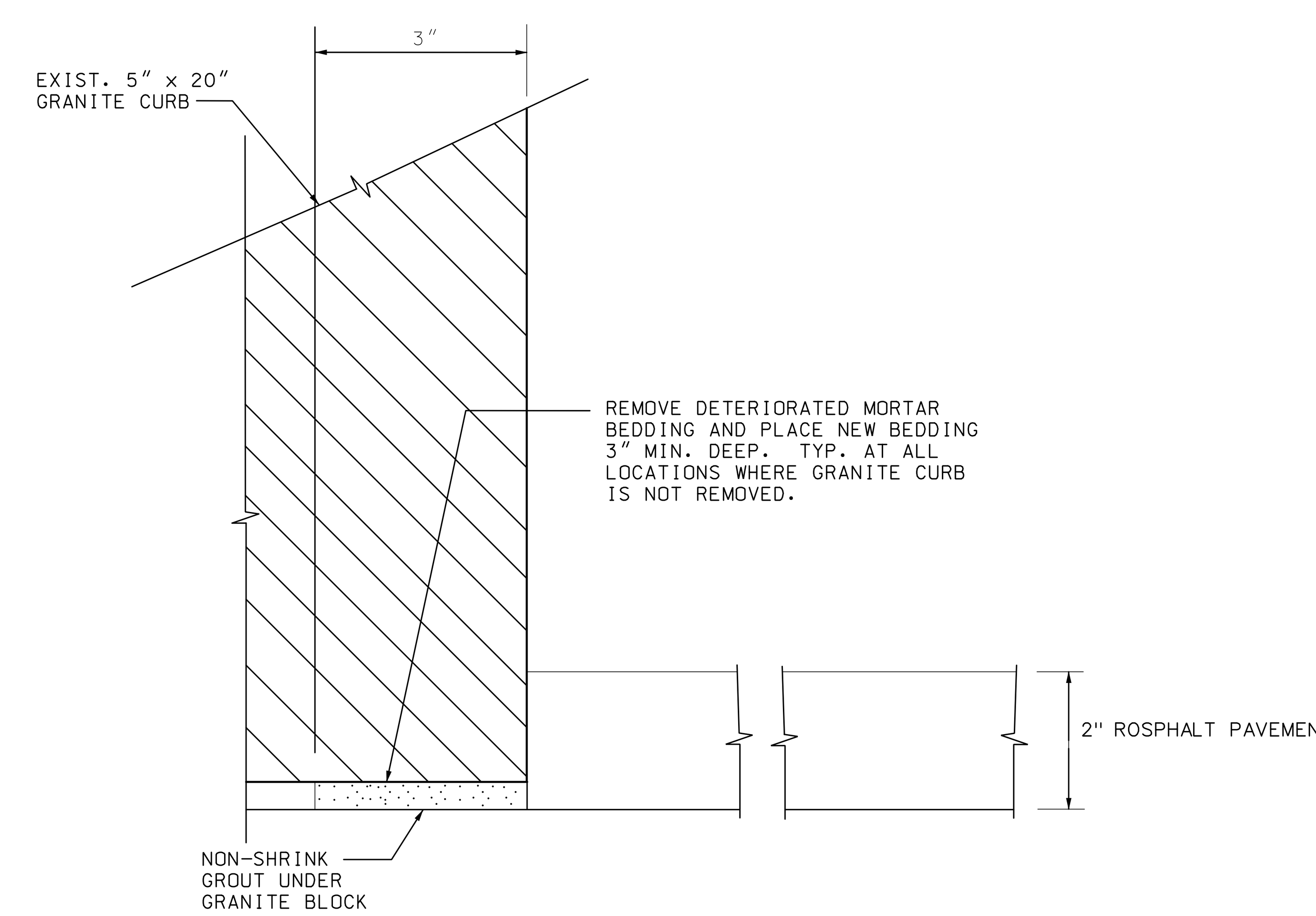
SCALE: 1"=1'-0"



NOTE: ½" Ø WROUGHT IRON OR GALVANIZED STEEL. 2 ANCHORS EACH CURB SHALL BE SET IN EXIST. HOLES IN BACK OF GRANITE CURB WITH NON-SHRINK GROUT.

GRANITE CURB ANCHORS

SCALE: 3" = 1'-0"



GRANITE CURB BEDDING DETAIL

SCALE: 6" = 1'-0"

SCALE: ¼" =1'-0" 4' 0 4' 8'
SCALE: 3"= 1'-0" 3" 0 3" 6" 9"
SCALE: 6"= 1'-0" 12" 0 3" 6" 9" 12"

US Army Corps
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CONCORD, MASSACHUSETTS

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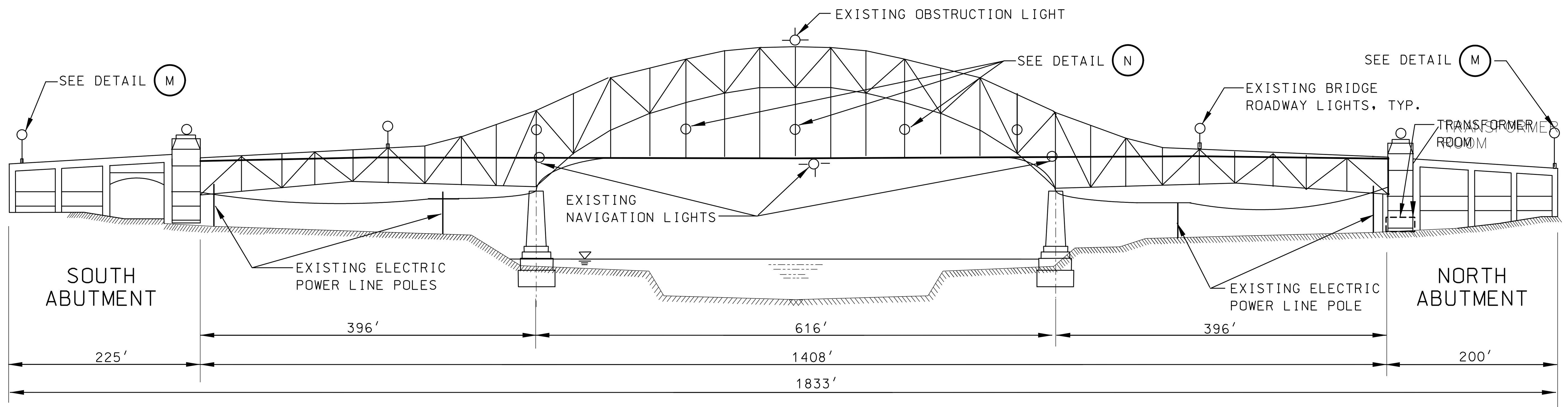
Drawn by: Jennifer Flanagan
Reviewed by: /s/ Jennifer Flanagan
Submitted by: /s/ Joseph A. Colucci, Team Leader, Technical Lead Unit

Date: February 2005
Rev.
Solicitation no. W912WJ-05-R-0004
Drawing code: CAP-105
File name: SBRs505.s09
Plot date: February 2005
Plot scale:

CAPE COD CANAL
DECK REPAIRS AND PAVING
SAGAMORE AND BOURNE BRIDGES
BOURNE, MASSACHUSETTS

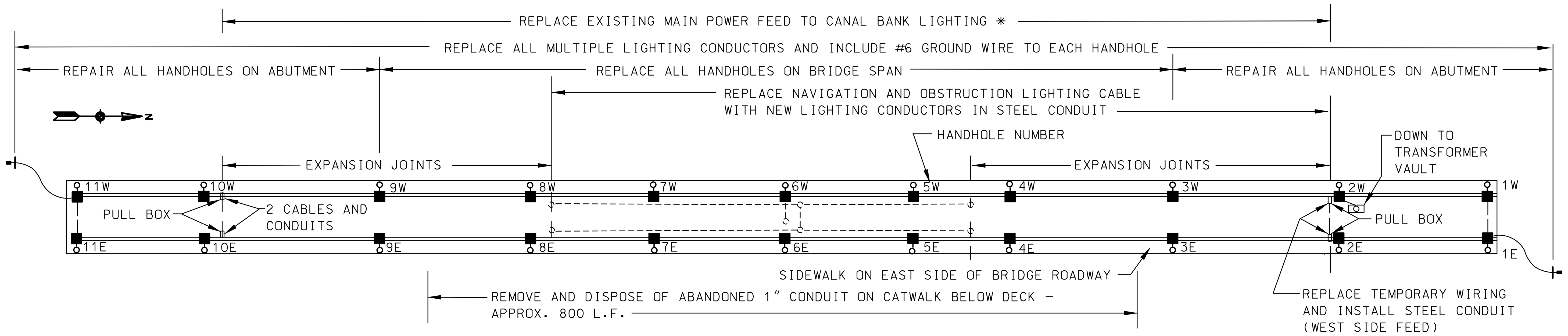
PAVING SEQUENCE AND MISCELLANEOUS DETAILS

Reference number:
S-5



SAGAMORE BRIDGE – EAST ELEVATION

SCALE: 1″=100′



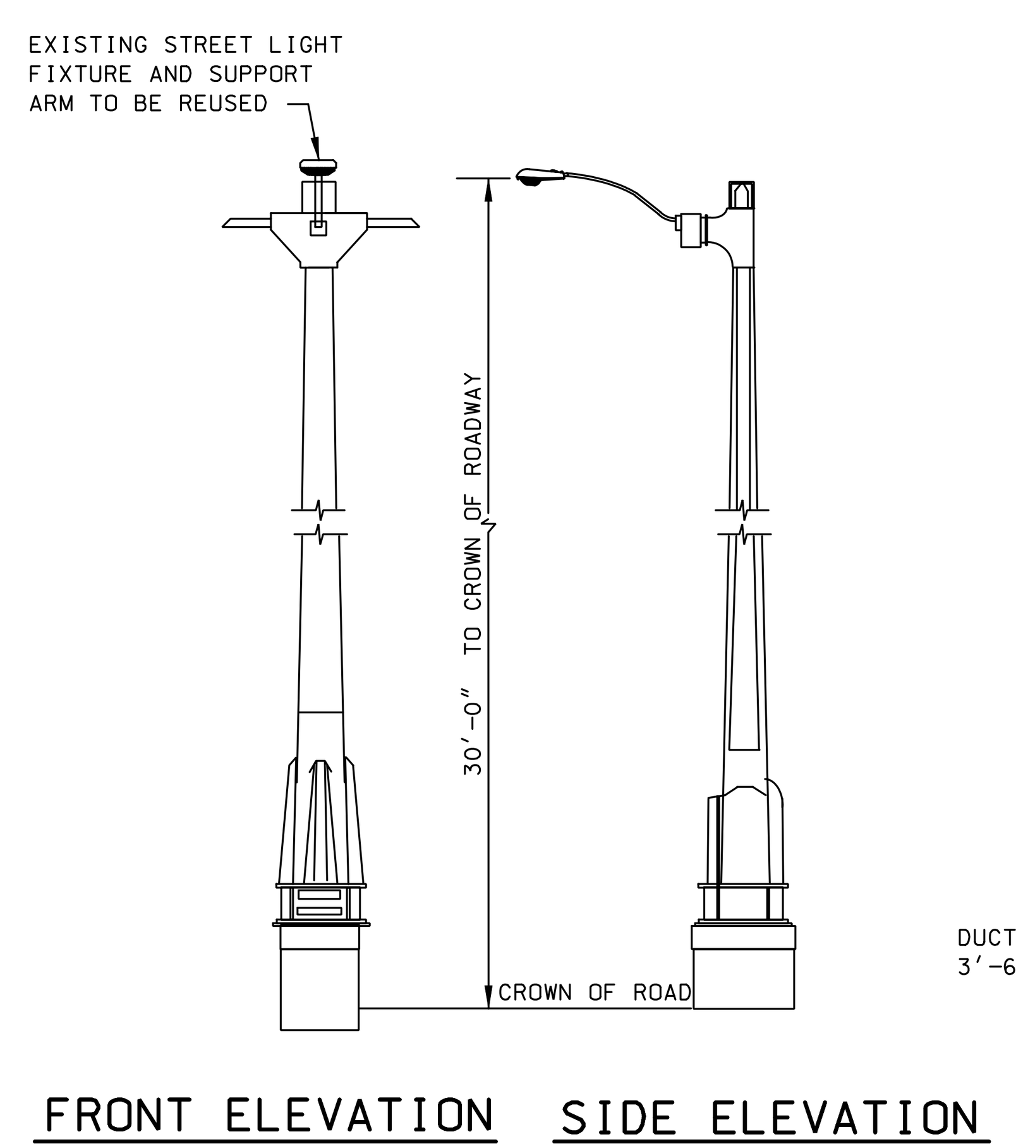
SAGAMORE BRIDGE PLAN

N.T.S.

* EXISTING MAIN POWER FEED TO CANAL BANK LIGHTING EXTENDS FROM POLE AT NORTH ABUTMENT, ACROSS CATWALK, AND DOWN TO POLE ON SOUTHSIDE SERVICE ROAD – APPROX. 1800 L.F. SEE NOTE NO. 7.

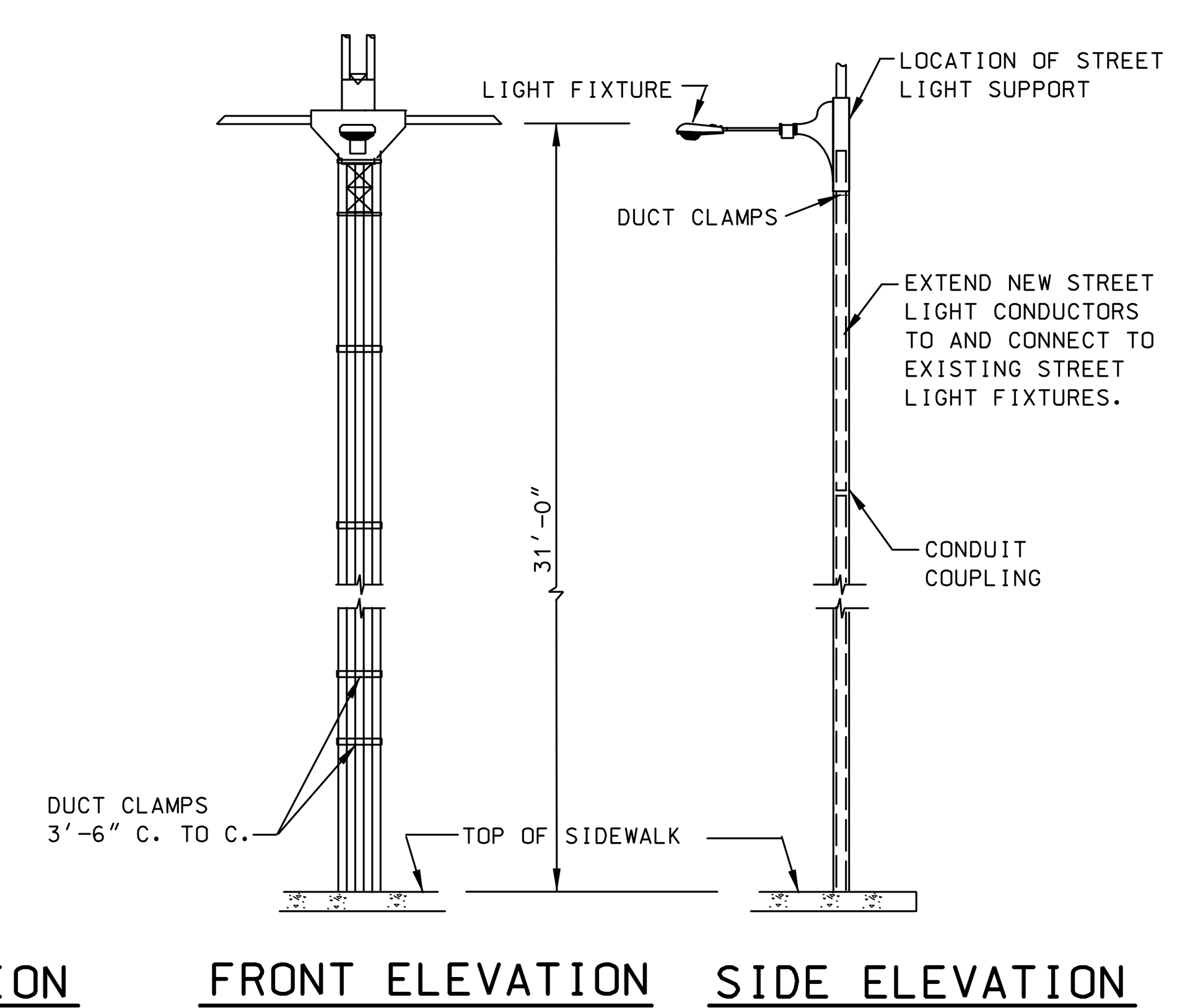
PANEL SCHEDULE

PANEL LOCATION	CIRCUIT DESCRIPTION	BREAKER TYPE
MAIN POWER	MAIN POWER DISCONNECT	100 AMP (2P) (SQUARE D)
PL – 1	NORTHSIDE EAST/WEST NAVIGATION LIGHTS (RED)	TYPE QO (SQUARE D) – 20 AMP (2P)
PL – 2	SOUTHSIDE EAST/WEST NAVIGATION LIGHTS (RED)	TYPE QO (SQUARE D) – 20 AMP (2P)
PL – 3	CENTER EAST/WEST NAVIGATION LIGHT (GREEN)	TYPE QO (SQUARE D) – 20 AMP (2P)
PL – 4	OBSTRUCTION LIGHT – CENTER RED	TYPE QO (SQUARE D) – 20 AMP (2P)
PL – 5	LIGHTS – TRANSFORMER ROOM	TYPE QO (SQUARE D) – 20 AMP (1P)



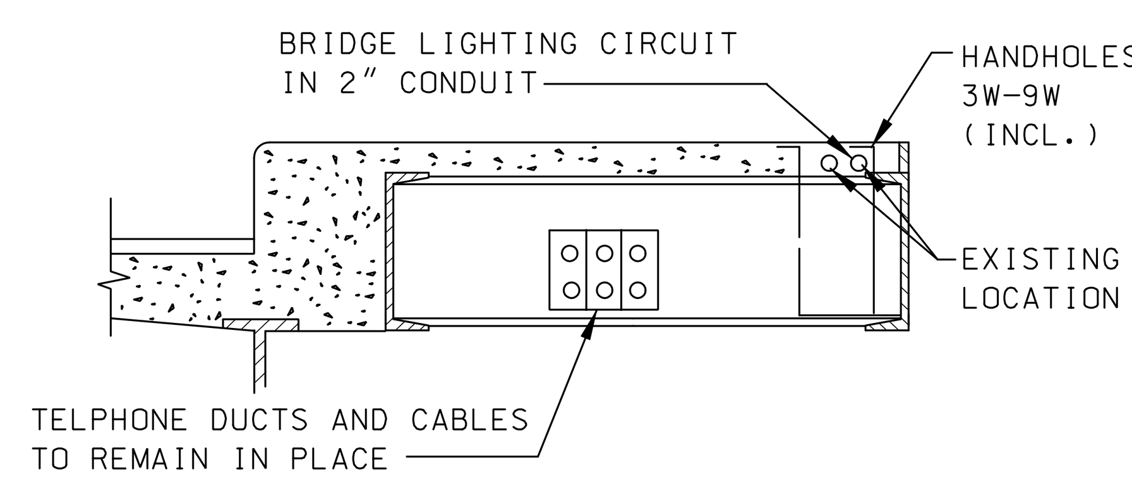
DETAIL M

N.T.S.



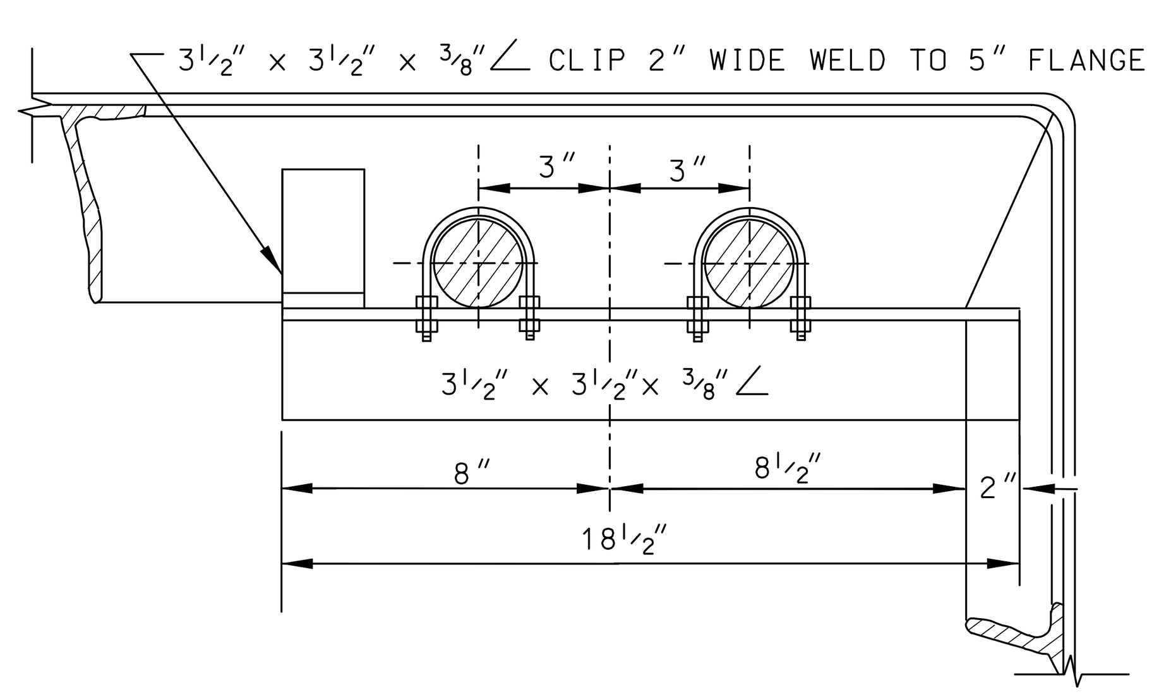
DETAIL N

N.T.S.



TYPICAL SECTION EXISTING WEST SIDE ELECTRICAL DUCTS

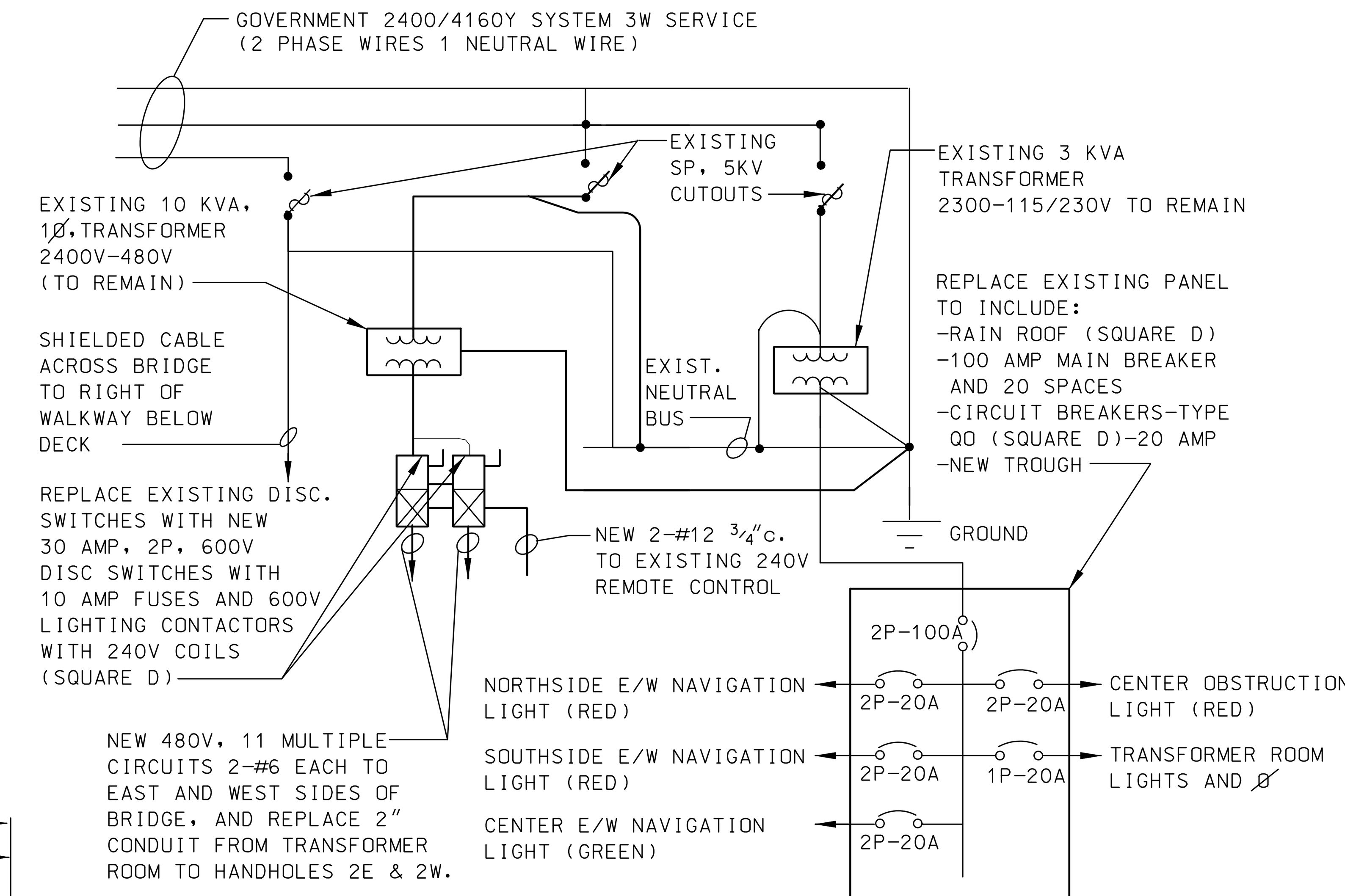
N.T.S.



TYPICAL CONDUIT SECTION

N.T.S.

(CURB SIDE SHOWN, SIDEWALK SIDE SIMILAR)



WIRING DIAGRAM

N.T.S.

NOTES:
1. ALL EQUIPMENT AND WIRING IS LOCATED IN NORTH PYLON TRANSFORMER ROOM AND IS EXISTING EXCEPT AS OTHERWISE INDICATED.

2. 2 – #8 TYPE THWN 600V STRANDED FOR EACH NAVIGATION LIGHT AND OBSTRUCTION LIGHT CIRCUIT. 4 CIRCUITS TOTAL.

LEGEND

EXISTING	DESCRIPTION
○	BRIDGE ROADWAY LIGHT
-○-	OBSTRUCTION AND NAVIGATION LIGHTS
■	ELECTRIC HANDHOLE
———	DUCTS
– – – – –	WIRES OR CABLES RUN OTHER THAN IN DUCTS AND BELOW BRIDGE FLOORS

NOTES:

1. CONTRACTOR MAY OBTAIN NECESSARY TEMPORARY CONSTRUCTION POWER FOR EQUIPMENT AND SUPPLEMENTARY CONSTRUCTION LIGHTING FROM GOVERNMENT ELECTRIC SERVICE LINE ON NORTH SIDE OF CANAL. CONTRACTOR SHALL FURNISH ALL EQUIPMENT AND CABLES, AND MAKE SUITABLE ARRANGEMENT.

2. CONTRACTOR SHALL MAKE TEMPORARY INSTALLATION OF APPROXIMATELY 1800 L.F. OF 2 – #6 WITH GROUND, 600V STREETLIGHT CABLE TO PERMIT OPERATION OF EXISTING ROADWAY FIXTURES ON EAST SIDE ONLY OR ON WEST SIDE ONLY AS REQUIRED BY RENOVATION PROGRAM. CONDUCTOR MAY BE INSTALLED OVERHEAD, OR UNDER BRIDGE FLOOR

3. ALL RIGID STEEL CONDUIT AND FITTINGS SHALL BE GALVANIZED AND SHALL HAVE A 40 MIL PVC JACKET.

4. CONTRACTOR SHALL FURNISH AND INSTALL APPROX. 700 L.F. OF 3 WIRE #8-600 VOLT CABLE FROM AREA OF HANDHOLES 2W TO 8W FOR OPERATION OF NAVIGATION AND OBSTRUCTION LIGHTS PRIOR TO REMOVAL OF EXISTING CABLE IN CONDUITS. CABLE SHALL BE RUN UNDER BRIDGE DECK AND REMAIN IN USE UNTIL PERMANENT CABLE IS INSTALLED AND IN USE.

5. FOR NAVIGATION/OBSTRUCTION LIGHTS, HOME RUNS WILL BE INSTALLED INTO NEAREST HAND HOLES TO EACH LIGHT LOCATION ON WEST SIDE. 3/4″ GALVANIZED CONDUIT SHALL BE INSTALLED FROM NEW HAND HOLES TO NEW 6″ STAINLESS STEEL JUNCTION BOXES (TO BE LOCATED ADJACENT TO EXISTING LIGHT FIXTURES). GALVANIZED CONDUITS FOR NAVIGATION LIGHTS SHALL BE ATTACHED TO EXISTING TELEPHONE CONDUIT SUPPORT HANGERS UNDERNEATH SIDEWALK. OBSTRUCTION LIGHT CONDUIT SHALL BE ATTACHED TO EXISTING 3″ CENTER SPAN SUSPENSION CABLE WITH STAINLESS STEEL HANGERS. CABLE SHALL BE RUN IN NEW CONDUIT FROM WEST SIDE TO EAST SIDE FOR EAST NAVIGATION LIGHTS. STAINLESS STEEL JUNCTION BOXES SHALL BE INSTALLED AT BOTH THE WEST AND EAST ENDS OF NEW CONDUITS.

6. AT BRIDGE EXPANSION JOINTS, REPLACE ALL EXISTING ELECTRICAL CONDUITS EXPANSION JOINTS WITH NEW STAINLESS STEEL FLEXIBLE NIPPLES. LENGTH AS NECESSARY TO CONNECT NEW OR EXISTING (REUSED) POWER RACEWAYS LOCATED AT THE BRIDGE EXPANSION JOINTS.

7. MAIN POWER FEED TO CANAL BANK LIGHTING SHALL BE #4 2/3C – 5K, INTERLOCKED ARMORED POWER CABLE.

8. CONNECT EXISTING TO BE REUSED CONDUITS TO NEW STAINLESS STEEL HANDHOLES WITH NEW STAINLESS STEEL FLEXIBLE NIPPLES.

SCALE: 1″= 100′ 100′ 0 100′ 200′

US Army Corps of Engineers
New England District

Date: February 2005
Solicitation no. W912WJ-05-R-0004
Drawing code: CAP-105
File name: SBRe501.s10
Plot date: February 2005
Plot scale:

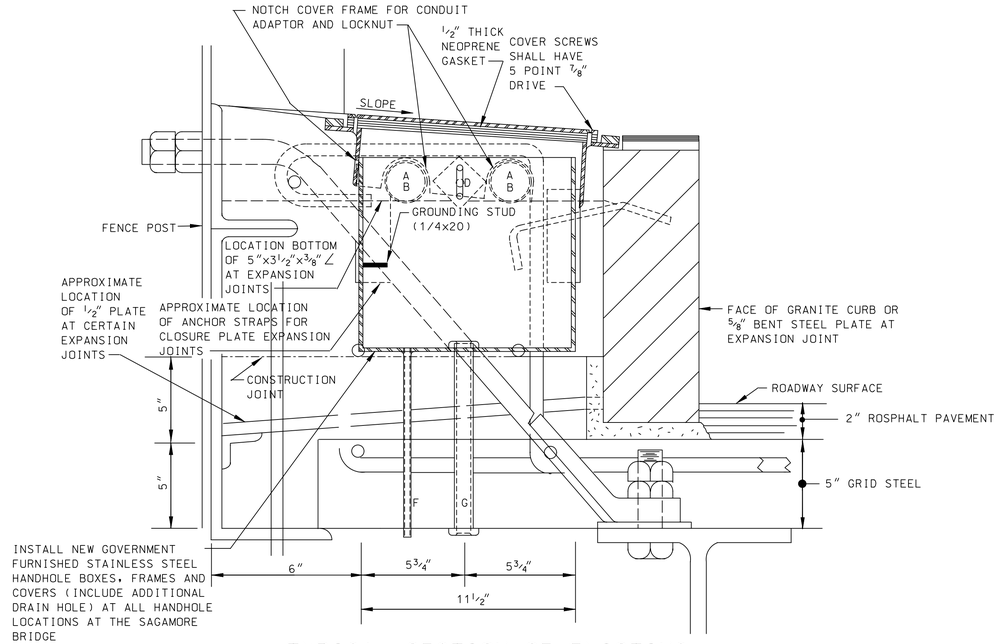
Designed by: Joseph A. Colucci
Drawn by: Jennifer Flanagan
Reviewed by: /s/ Jennifer Flanagan
Submitted by: /s/ Joseph A. Colucci
Team Leader, Technical Lead Unit

U.S. ARMY ENGINEER DISTRICT
CORPS OF ENGINEERS
CONCORD, MASSACHUSETTS

CAPE COD CANAL
DECK REPAIRS AND PAVING
SAGAMORE AND BOURNE BRIDGES
BOURNE, MASSACHUSETTS

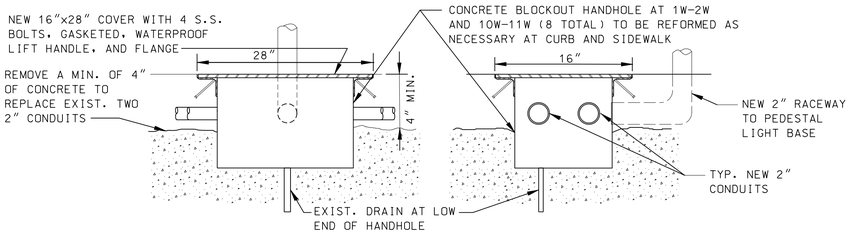
SAGAMORE BRIDGE ELECTRICAL DETAILS

Reference number: E–1



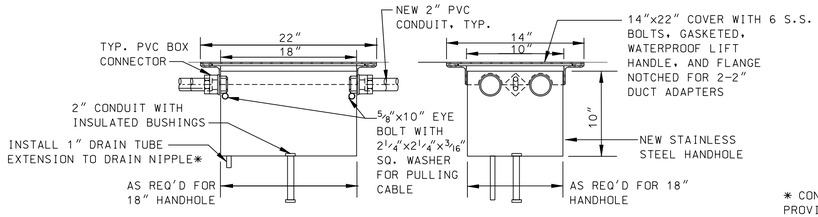
TYPICAL SECTION OF EXISTING BRIDGE SPAN ELECTRICAL HANDHOLE

N.T.S.



ABUTMENT HANDHOLE DETAILS - CURB & SIDEWALK

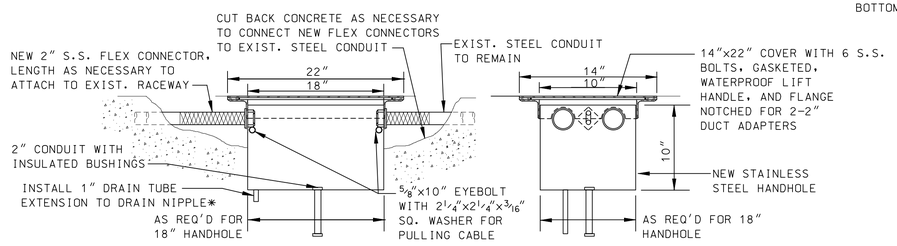
N.T.S.



BRIDGE HANDHOLE DETAILS - CURB

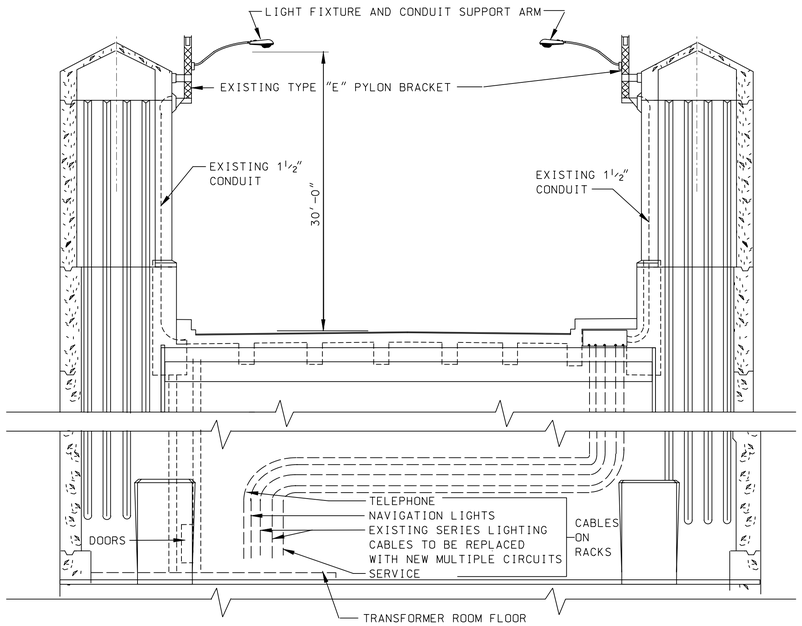
N.T.S.

* CONTRACTOR TO PROVIDE 1" SCH. 40 S.S. PIPE, 12" LONG AND ATTACH TO HANDHOLE DRAIN NIPPLE TO EXTEND DRAIN BEYOND BOTTOM OF CONCRETE



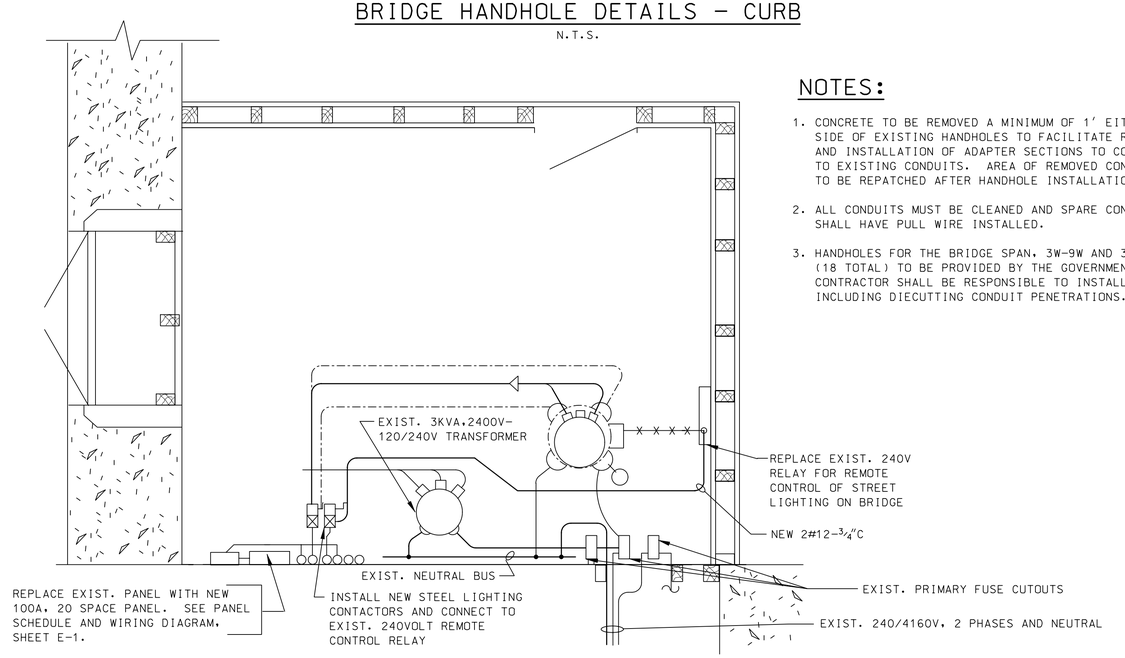
BRIDGE HANDHOLE DETAILS - CURB

N.T.S.



CONDUIT LAYOUT IN ABUTMENTS

N.T.S.



PLAN - TRANSFORMER VAULT

N.T.S.

NOTES:

1. CONCRETE TO BE REMOVED A MINIMUM OF 1' EITHER SIDE OF EXISTING HANDHOLES TO FACILITATE REMOVAL AND INSTALLATION OF ADAPTER SECTIONS TO CONNECT TO EXISTING CONDUITS. AREA OF REMOVED CONCRETE TO BE REPATCHED AFTER HANDHOLE INSTALLATION.
2. ALL CONDUITS MUST BE CLEANED AND SPARE CONDUITS SHALL HAVE PULL WIRE INSTALLED.
3. HANDHOLES FOR THE BRIDGE SPAN, 3W-9W AND 3E-9E, (18 TOTAL) TO BE PROVIDED BY THE GOVERNMENT. CONTRACTOR SHALL BE RESPONSIBLE TO INSTALL, INCLUDING DIECUTTING CONDUIT PENETRATIONS.

US Army Corps of Engineers
New England District

Symbol	Description	Date	Appr.

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BOURNE, MASSACHUSETTS

SAGAMORE BRIDGE
ELECTRICAL SECTIONS AND DETAILS

Reference number:
E-2
Sheet 11 of 11